NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 3, NUMBER 34 OCTOBER 27, 1986

▶ ANALYSIS

AT&T faces music after reshuffle

Giant forced into tough cuts.

BY PAM POWERS
Senior Editor

The internal upheaval set in motion by AT&T's recent corporate restructuring is beginning to come to light.

Since merging its Information Systems and Communications divisions to compete more effectively against powerful rivals like IBM, AT&T has adopted far-reaching cost-cutting plans that are having a profound impact on the company's work force and its business strategy. AT&T is making deeper-than-expected cuts in its employee ranks and is working to shed unprofitable lines of business.

Network World has gleaned inside details of AT&T's reorganization plan from key industry sources, who asked not to be named. The reorganization-spawned severance plan, which the company claims is only in the early stages of implementation, is already well under way, the sources said. It will involve a much larger number of employees than had been suggested by earlier AT&T reports. The sources said as many as 100,000 workers may ultimately lose their jobs.

AT&T reportedly is also slashing the budgets of work groups involved with unprofitable computer-related ven-

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NEWSPAPER

▶ LONG-DISTANCE DECISIONS

US Sprint rolls up a string of victories

BY JOHN DIX
Senior Editor

In its relentless pursuit of AT&T and MCI Communications Corp., US Sprint Communications Co. has snared a huge contract to serve as the primary carrier in the sprawling private network of Honeywell, Inc. The Honeywell deal is only one of many major corporate accounts the company has captured within the last six weeks, industry sources report.

Although both companies admitted having discussed service contracts, neither would comment publicly on the extent or status of the rumored deal.

But, according to sources, US Sprint

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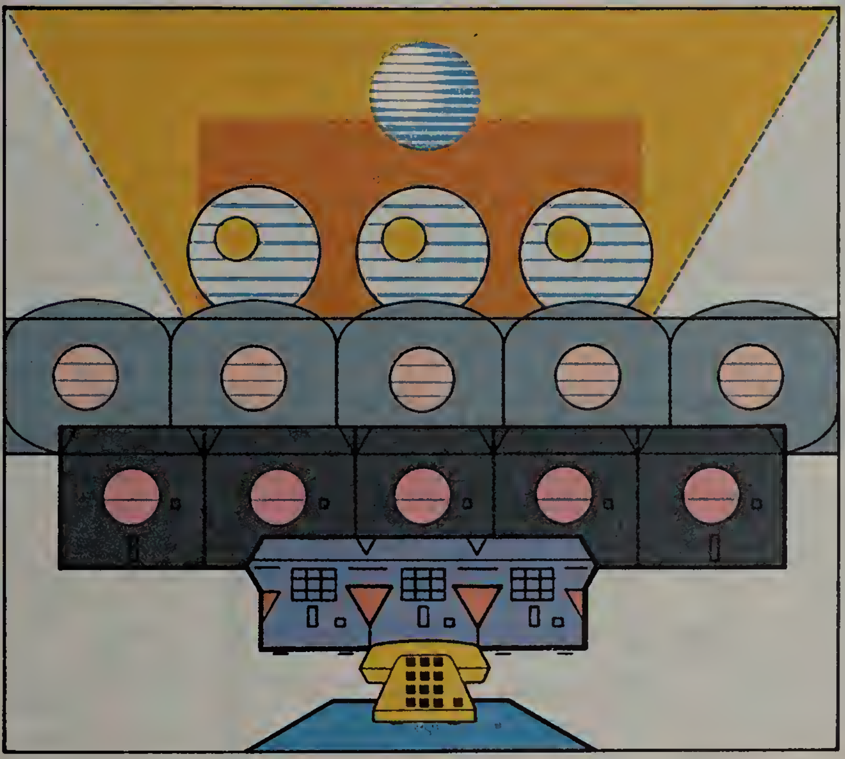
FEATURE FOCUS

AT&T breathes new life into its switch-and-wire beast

Evolution of an intelligent network



BY JOHN DIX
Senior Editor

BASKING RIDGE, N.J. — After more than 100 years in the making, AT&T's network is coming alive.

The carrier's long-dormant switch-and-wire beast is evolving into a responsive creature that, when poked, will twitch and change at the user's whim.

The heart and muscle of the emerging intelligent network is made up of digital switches and transmission systems.

The central nervous system is made of software control.

Together, these technologies are spurring the development of new AT&T services. They are also making it possible to give

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▶ CORPORATE NETWORKS

AT&T hijacks lucrative deal

BY JOHN DIX
Senior Editor

SAN FRANCISCO — AT&T snatched up an important contract with the Bank of America here recently when it convinced senior bank officials to adopt one of its data networking systems instead of a multivendor solution backed, at least in spirit, by IBM.

Sources said AT&T's eleventh-hour contract victory left Doelz Networks, Inc. of Irvine, Calif., out in the cold and jeopardizes a separate but related deal the bank had cut with Network Equipment Technologies Co. (NET). IBM has worked with NET on other major accounts and is reported to have promoted the use of NET equipment as a foundation for a larger network project IBM is working on for the bank.

The deal AT&T grabbed involved the

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▶ SOFTWARE-DEFINED NETWORK

AT&T seeks SDN fee cut

Voice net's slow sales prompt rate slash.

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — AT&T last week asked the Federal Communications Commission for permission to reduce by nearly half the network design charge for its strategic Software-Defined Network (SDN) service. AT&T plans to cut the charge from $105,000 to $60,000.

AT&T's stated reason for the price slashing was that the cost of implementing SDN has been lower than the company anticipated when it first proposed the service last year. But the company also admitted that the expensive, up-front fee was discouraging wider use of the service. If approved by the FCC, the pricing change would take effect Nov. 28.

SDN is a virtual private network implemented on AT&T's public switched network. Intelligence within central office switches enables AT&T to use switched facilities to build customer networks that offer features and control capabilities found in private nets.

The SDN service is a vital component in AT&T's long-range strategy to move customers away from private-line service and onto the switched network. It is also an integral part of AT&T's Integrated Services Digital Network scheme.

The current $105,000 installation charge presented a serious "barrier to entry," according to Alan Kuritsky, district manager for SDN marketing. "We initially priced the service high to guarantee we could do a quality job," Kuritsky said. "But we found SDN had a higher price than customers were willing to pay. We also found that designing and implementing SDN did not require the time and manpower we had anticipated."

The network design or installation charge covers collection of customer calling data, engineering of the virtual private network, obtaining special-access lines from local exchange carriers, cutting over customer service, testing and service.

AT&T denied reports that SDN is not catching on in the market as hoped. "Of course we always want to stay cost-competitive and want to attract as many customers as possible," Kuritsky said. "Large corporations have really rushed to SDN, and the response far exceeds our initial expectations."

AT&T anticipated that it would enlist only three initial customers for SDN, according the tariff filing made with the FCC about a year ago. "AT&T's initial expectations were very low, and it didn't take much to exceed those expectations," said Robert Ellis, president of the Aries Group, Inc., a consulting firm in Rockville, Md.

"The cost of SDN even after the cut is still astronomical and you have to question why AT&T is pricing it so high," Ellis said. "AT&T wants to keep resellers off the network and has priced it high to accomplish that," he said. MCI [Communications Corp.] only charges a $5,000 initial fee for its comparable Vnet service, in addition to a $2,500 per month fee, which AT&T does not charge.

AT&T expects SDN to make only modest gains as a result of the price fee, according to documents filed with the FCC. AT&T estimates SDN use will increase about 5%.

SDN, a high-volume analog voice service, is designed as an alternative to private lines, but can be interfaced with private corporate nets to form hybrid networks. It is best suited to geographically distributed users with remote offices communicating with a central location.

▶ STATE NETWORKS

S.C. net to save $3.6m

BY MICHAEL FAHEY
Staff Writer

Second of a two-part series.

COLUMBIA, S.C. — How did a small southern state transform its inefficient and disjointed voice and data communications system into an integrated network that has become a model for other states?

The answer, according to Ted Lightle, director of South Carolina's Division of Information Resources Management, is aggressive and forward-looking communications management. That management approach, he said, has made it possible for the state to scrap its Centrex system, completely upgrade its telecommunications equipment, install a new statewide microwave backbone net and save a bundle of money in the process.

"What we've done is provide new, more modern equipment that will help run state government more efficiently," Lightle said. "And we figure, in 10 years, we will realize a $3.6 million saving over what we would have paid if we kept the older Centrex service and leased telephone equipment."

Since December 1984, South Carolina has installed 11 AT&T System 85 private branch exchanges, 19 System 75 PBXs and, according to Lightle, "a lot of Merlin and Horizon Systems." The state also purchased more than 30,000 telephones to replace leased phones.

In August, the state completed installation of a $23 million microwave network that serves the South Carolina Educational Television Network. "In the past, we appropriated $4 million annually to lease microwave facilities," Lightle said. But the cost of the leased ser-

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Network World wants to make its news coverage even better, and for that we ask your help. If you know of an interesting event that just occurred or is about to occur, please call. We'd also like to know how you're optimizing your networks. Call Bruce Hoard toll-free at (800) 343-6474.

▶ NET MERGERS

GE Semi builds X.25 packet net

Task force helps merged firms cope.

BY MARGIE SEMILOF
Senior Writer

RESEARCH TRIANGLE PARK, N.C. — Communications management at GE Semiconductor Business here is artfully completing the delicate task of building an international packet-switching network, while at the same time adding to it newly merged companies.

When parent company General Electric Co. acquired RCA Corp. this year, GE Semiconductor merged with former rival RCA Solid State, RCA's semiconductor division. The merged companies were renamed GE Semiconductor Business.

> *"The X.25 packet network was designed to accommodate sporadic peaks of critical data traffic."*

W.E. Harrelson, manager of telecommunications and office systems at GE Semiconductor, was already extending the company's domestic packet network internationally. Although the merged companies share no other telecommunications facilities, the commercial division of GE Semiconductor Business — called GE/RCA Solid State — and two previously reorganized GE divisions were to be melded into the packet network plan.

The CCITT-compatible, X.25 packet network was designed to accommodate sporadic peaks of critical data traffic entering the network hub site here from GE Semiconductor's commercial business units. The packet facilities replaced existing statistical multiplexing equipment.

"We could have extended our statistical multiplexer network internationally," he said. "It would have supported most protocols, but we wouldn't be creating a standard for ourselves, nor would we be guaranteed to support everything without going to a lot of extra effort."

Harrelson investigated a variety

See **Merger** page 38

Network Management Compatibility Brings Timeplex T-1 Product Diagnostics Support To IBM SNA Environment

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▶CHIP TECHNOLOGY

80386 seen in PBXs and file servers

BY MARY PETROSKY
West Coast Correspondent

SANTA CLARA, Calif. — Intel Corp. says users should look for a variety of communications products based on its powerful and versatile 80386 microprocessor, including private branch exchanges and local-area network file servers, to hit the market next year.

The company has geared up to produce some two million 80386 chips in 1987 but expects actual market demand for the product to be between 500,000 and one million chips, according to Dana Krelle, Intel's 80386 marketing manager.

Although the microprocessor will be used most frequently in computer systems ranging from desktop workstations to minicomputers, it will be employed for a wide range of other applications, Krelle said. Vendors of factory automation equipment are using the chip in process controllers and robotics applications, while the military is looking to incorporate the 80386 in guidance and radar systems.

The 80386 could be used as a central host processor in a PBX to support applications such as routing and cost accounting. A number of PBX vendors are experimenting with the microprocessor to support personal computer communications applications, Krelle added.

Consultants voiced skepticism about the use of the 80386 to provide enhanced services for PBXs. "It's enough of a hassle just to get these switches to switch voice and data," said Greg Cipriano, senior partner with consulting firm Telecom Resources, a division of SMT, Inc. in Stoughton, Mass.

Improved data networking

Ian Angus, president of Angus TeleManagement Group, a telecommunications consulting firm in Toronto, said he believes users might get improved data networking, including protocol conversion, out of PBXs if vendors opt to incorporate the 80386 in their systems.

The 80386 features a 32-bit architecture, can address four gigabytes of memory and 64 terabytes of virtual memory and can run applications written for the Intel 8088, 8086, 80186, 80188 and 80286 chips. The microprocessor's multitasking capabilities and virtual 8086 mode allow it to concurrently support applications written for different operating systems.

The chip is currently available in 12-MHz and 16-MHz versions, with a 20-MHz version now being sampled, Krelle said. The ability to process data at a high speed is one of the reasons the 80386 is appealing in communications applications, he said. When operating at 16 MHz, the chip can pipe data across its bus at a rate of 32M byte/sec.

By comparison, the 80286 can support internal data rates of 8M byte/sec when operating at 8 MHz, Krelle explained.

Increased server performance is one reason local-area network vendors are interested in the 80386. "The 386 is an exciting product and we should all race to incorporate it," said Bob Metcalfe, chairman of 3Com Corp. and senior vice-president of the company's New Product Division.

Memory management

Metcalfe is particularly excited about the processor's memory management capabilities, which will provide support for sophisticated data caching.

In addition, the 80386's virtual mode would allow servers to handle multiple applications, such as print, file and mail services, and allow for gateways that can support multiple connections. Combining several functions on one server will help users save money, Metcalfe said. He also expects data base servers for personal computer local nets to be developed with the 80386 chip.

▶ PERSONAL COMPUTER NETS

LAN snafus solvable

Proper configuration, installation key.

BY MARY PETROSKY
West Coast Correspondent

Although software is often at the root of local-area network snafus, proper installation and configuration of hardware and the use of quality components can go a long way toward improving network reliability.

"A local-area network is a system, and because of that, it's much more difficult to figure out where it's failing," said Charles Bornheim, president of Micromega Systems, Inc., a personal computer and local-area network consulting firm based in San Francisco. "I think the problems are primarily caused by incompatibility of components, servers and cabling."

Mixing components from different vendors on a network is a leading cause of problems. Mitre Corp. of Bedford, Mass., has tried to use Ethernet interface boards from different vendors on the same network without success, according to Lee LaBarre, technical staff member. Likewise, many consultants have found that IBM Personal Computer-compatibles often don't work properly on a network.

Some network vendors provide listings of the IBM Personal Computer-compatibles and other hardware they support. Many clones won't work with Novell, Inc.'s Netware operating system, according to Bornheim. Other consultants noted that Netware is finicky about the disk drives that can be used.

Not only do users need to consider which personal computers they use as servers and workstations and which disk drives they tie to the network, they also need to be careful about using other add-in boards in conjunction with network interface boards. Putting several non-IBM cards into an IBM Personal Computer server can result in conflicts with I/O ports, direct memory access channels, memory map locations and interrupts, according to J. Scott Haugdahl, a senior systems specialist with the consulting firm Architecture Technology Corp. in Minneapolis.

> *"Mixing components from different vendors is a leading cause of problems."*

Local network consultants strongly recommend that users test components on the network before committing to them.

Cabling issues are another frequently cited problem area. "With cabling, the problem typically is a faulty workstation interface connection. Either it's loose, it's been disconnected or somebody tripped over the wire," said Charles Hanes, manager of technical consulting for the Lanquest Group, a consulting firm in Santa Clara, Calif. The key questions regarding cabling are whether it is connected properly, whether it is terminated at each end and whether there are any other interference issues along the cable, Hanes said.

Sloppy cable installation is usually at the bottom of these kinds of problems. One Lanquest client encountered problems caused by a coaxial cable routed over a steam pipe in the ceiling. When the pipe heated up, it created interference that blanked the signal in the cable. Twisted-pair wiring is susceptible to induction over long distances, Bornheim said.

It is commonly believed that network components, such as interface boards and hub devices, are for the most part reliable. "The network never breaks, what usually

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▶ BROADBAND BLUEPRINTS

Ford spreads LANs over 23 plants

Allen-Bradley designing facilitywide factory floor networks.

BY BOB WALLACE
Senior Writer

DETROIT — Ford Motor Co. last week embarked on an ambitious and sweeping networking project that calls for the installation of facilitywide broadband local-area networks to handle a wide spectrum of communications applications at 23 of the automaker's manufacturing plants.

Ford signed on Allen-Bradley Co.'s Communication division to design, install and certify the broadband systems, an undertaking that will represent $900,000 of the project's $6 million price tag. Allen-Bradley officials claimed installation of the broadband cable plant at the first of the body and assembly plants, Ford's Louisville, Ky., truck plant, is already near completion.

Cable systems are expected to be installed at the 22 remaining facilities by the end of 1987. The broadband system will handle the factories' office, design and engineering and plant floor network needs.

> *“The broadband system will handle office, design and engineering and plant floor net needs.”*

The nation's No. 2 auto manufacturer has not yet acquired broadband networking equipment or peripheral data communications gear for this Herculean networking enterprise. Ford would not say what portion of the $6 million budget is earmarked for equipment purchases.

Allen-Bradley will be one of a horde of vendors working to secure a piece of what will likely be a multimillion dollar broadband networking gear contract.

This effort is not Ford's first factory networking foray. In June, the automaker's Body and Assembly division announced a joint development project with IBM, designed to enable plant floor personal computers to communicate over a single channel of Ford's Wayne, Mich., broadband factory network. The current status of this project is unknown.

The Wayne facility, which manufactures subcompact cars, served as the pilot plant for the division's first broadband plantwide net. The success of the system was instrumental in Ford's decision to implement similar networks in the other 23 facilities.

Ford spokesman Jay Meisenhalder said implementation of the broadband systems in the 23 plants would provide Ford with a foundation upon which to build Computer-Integrated Manufacturing (CIM) systems. The CIM concept calls for interlinked office, design/engineering, data processing and plant floor networks within a single manufacturing facility.

“The cable systems will create a networking infrastructure, which will allow us to introduce new factory technology into these plants faster,” he said.

Meisenhalder said the coaxial cable-based system will be used to support multiple networks. He cited video as another application currently being considered for the networks.

Ford would not say what networks would operate over the massive broadband cable system.

The Ford spokesman explained that none of the 23 plants to be outfitted with broadband nets currently operates any type of plantwide communications network.

Kevin Hughes, MAP and Data Highway Products product marketing manager for Allen-Bradley, said the broadband systems will be installed without interruption to the day-to-day operations of the Ford factories. He added that the cable plants will conform to the IEEE 802.7 specifications, which are approved methods for the design and installation of broadband networks.

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▶ TELCOM GENERAL

Low sales push Vsat maker to trim forces

BY NADINE WANDZILAK
Staff Writer

SAN JOSE, Calif. — Slower than anticipated sales of its very small aperture terminal satellite systems resulted last week in a second round of layoffs at Telcom General Corp., a financially troubled Vsat and C-band satellite equipment and network supplier here.

A Telcom General spokeswoman said last week that the company had laid off approximately 30 workers, a quarter of its staff. However, a source within the company, who asked not to be named, said the company laid off 40 management-level workers, including three vice-presidents. Earlier in the month, the company reduced its manufacturing work force by 50 employees, according to the source. The company spokeswoman acknowledged the earlier layoffs but would not confirm the number. The source said Telcom General also may be up for sale. The spokeswoman denied the allegation.

An unnamed consultant also questioned the matchup of Telcom General and British Petroleum, p.l.c., which has owned 80% of the California-based company since 1985.

"Reduced shipments of the company's Vsat products have resulted in a reduction in work force," said Telcom General's president and chief executive officer, Robert Friedman.

Engineering and field operations were not affected by the cuts, the company said. Workers involved with the company's C-band Satpac satellite service were unaffected by the reductions, according to the spokeswoman.

Friedman attributed sluggish sales to tepid user acceptance of the satellite bypass technology. The company offers the KuNet private data communications satellite network service, which was introduced in January. Friedman said he is optimistic that the Vsat market will improve.

Bill Reed, director of research services for Link Resources Corp. in New York, characterized Telcom General's Vsat offering as a low-end offering.

Sluggish sales of Vsat equipment and services have also spelled trouble for other industry participants. In June, Mountain View, Calif.-based Equatorial Communications Co. was forced into layoffs and work-week reductions.

Last week, Equatorial announced the resignation of Dean Mack as president and CEO and the appointment of Edwin Parker as acting president and CEO. Parker had been the company's vice-president.

A number of companies within the Vsat industry geared up staffing and production about a year ago for a rapid takeoff, according to consultant Philip Arst of Communication Strategies Associates, Inc. in Saratoga, Calif.

These companies grossly underestimated the time that large corporations invest in choosing new communications technologies, Arst said. The number of companies that jumped into the Vsat market also confused potential customers, he said.

"It's unusual for an industry this young to have this many entrants," Arst said. Two-way Vsats have been offered for two years at most, he said, with commercial shipments within only the last 18 months. Many potential buyers are taking a wait-and-see attitude.

"It's not that the interest in Vsats is not there," he said. "It's just that potential customers wait longer before signing on the dotted line."

AT&T entry validated market

AT&T's entry into the Vsat marketplace, with its Skynet Star Network Service, validated the market, according to Arst. AT&T began to offer Skynet in May after challenges by Equatorial, GTE Spacenet Corp. and several other satellite service vendors that claimed Skynet was priced to drive competitors out of the Vsat marketplace.

But, Arst said, the introduction of Skynet delayed some customers' decisions.

"They wanted to see AT&T's product before making a decision," he said.

▶ CENTREX SUPPORT

Consultancy counsels small firms

BY MICHAEL FAHEY
Staff Writer

SAN FRANCISCO — A one-year-old start-up company based here claims to be tapping a new market niche by offering equipment and service for companies that use Pacific Bell Centrex services.

Centrex Support Group, Inc. provides telephone equipment, design consulting and service for small businesses that use Centrex to support as many as 300 telephones. The company claims to have more than 100 customers already, and it is reportedly winning an average of 35 new clients a month.

"Companies in the Centrex terminal equipment market have concentrated on the larger users," said Tom Bustamente, Centrex Support Group executive vice-president. "The general pattern in the communications industry is that everyone goes for the biggest fish first. We've decided to start at the other end."

Bustamente said his company helps customers select equipment, and it provides training and support after the equipment is installed.

According to the executive vice-president, Centrex Support Group gets leads about prospective customers from Pacific Bell Centrex sales representatives. (Pacific Bell is not allowed to market customer premises equipment.) Centrex Support Group then works with the telephone company to provide "one-stop service," he said.

Program prevents finger-pointing

If users have a problem with their phone systems, Centrex Support Group acts as the user's liaison with Pacific Bell.

"We are part of their equipment trouble reporting program," Bustamente said. "This program prevents finger-pointing. There is a set of procedures to follow in order to find the root of any problem."

"We see ourselves as being in a team role with Pacific Bell," Bustamente said. "We are exclusively devoted to supporting Centrex installations. We do not sell key systems or private branch exchanges.

"Unlike most of the interconnects, we are not in an adversarial position with Pac Bell. I make money on the service and equipment I sell. Pacific Bell makes money on what it sells."

According to Bustamente, Pacific Bell benefits from its relationship with Centrex Support Group because the company is able to market Centrex as a turnkey telecommunications system.

Bustamente said several regional Bell operating companies, including US West, Inc., provide Centrex service and equipment through unregulated subsidiaries. He added that his company's relationship with Pacific Bell provides the telephone company with a hardware supplier without assuming the additional expense and responsibility of creating an nonregulated subsidiary.

Centrex serves 750,000

According to Bustamente, Pacific Bell's Centrex system currently serves more than 750,000 users. By 1995, Pacific Bell expects to have 1.4 million Centrex lines generating $55 million in equipment sales alone, he said.

Bustamente said he believes similar Centrex support ventures could be started in all of the RBOC territories.

"However," he cautioned, "you have to research and understand the industry and know how your regional telphone company runs its Centrex programs."

▶ NET CHANGES

Avis set for switch to Vsat

Firm says savings prompted the move.

BY BOB WALLACE
Senior Writer

GARDEN CITY, N.Y. — Avis Rent-a-Car Systems, Inc. plans to cut and control its leased-line costs by implementing a two-way, very small aperture terminal satellite network that will link as many as 200 Avis locations to the auto renter's data processing center here.

Avis, which expects to save $200,000 annually by replacing many of its leased-line links with Vsats, claimed it will be able to hook new locations to the satellite net faster than it could add sites to its nationwide leased line net.

The company recently concluded a three-month, four-site, pilot Vsat network test and has signed a multiyear pact with Equatorial Communications Co., which will install all components of the satellite network. Once completed, the system will handle data communications between IBM 3270-type terminals at Avis' car reservations facilities and an IBM 3081 mainframe at the DP center. IBM 3624 Automated Teller Machines and terminals manufactured by Diebold, Inc. will also transmit and receive data over the network in IBM's Systems Network Architecture/Synchronous Data Link Control format.

Peter Tittler, telecommunications vice-president for Avis, said that reducing the cost of operating the company's leased-line network was the primary force behind the decision to build the Vsat net. "Local access and leased-line costs continue to escalate," he said.

Tittler cited an Avis location in California as evidence of how tariff changes had driven up prices. "A few years ago, it cost Avis $600 a month to link this site to the net. This cost grew to $900 a month a few months ago," he related. "Now it costs us $3,200 a month for the network connection."

"By signing a multiyear contract with Equatorial, I know exactly what the cost of operating the network will be for several years," he said. "Since local access and long-distance private-line charges continue to rise, I'm certain we will save more money every year."

Tittler also spoke of the sorely needed flexibility to add new locations to the network quickly. "After the bidding for specific locations at airports is announced, we have 30 days to construct our facility," he said. "We cannot get a leased line to a new office in 30 days, but we can have a Vsat set up at the location in that time."

See **Avis** page 7

▶ETHERNET AVENUES

3Com and Apollo sign pact for net link gear

Ethernet adapters bridge Domain nets.

BY MARY PETROSKY
West Coast Correspondent

MOUNTAIN VIEW, Calif. — Under a two-year contract valued at $4 million, 3Com Corp. will supply Apollo Computer, Inc. with its Etherlink Plus network adapters for use in Apollo's Domain Series 3000 Personal Workstations.

Last month, Apollo announced it would be offering what it has dubbed the "Ethercontroller-AT" for its low-end Series 3000 workstations. The announcement named 3Com as the product's supplier. This is the first Ethernet connection for the Series 3000, which was introduced in February.

Apollo last week also reported that its third-quarter sales were $100,408,000, an 82% increase over sales for the similar quarter last year. This is the first time Apollo exceeded $100 million in sales for one quarter.

The Ethernet adapter, priced at $2,000, will enable Apollo users to bridge multiple Domain networks across an Ethernet backbone network. It will also provide a gateway to other vendors' systems across Ethernet networks.

Apollo first offered connections from its proprietary, 12M bit/sec token-ring network to Ethernet three years ago, said Mark Hatch, marketing manager for operating systems and networking. These connections were for Apollo's higher end workstations, which use a Multibus design.

Prior to the announcement of the Ethercontroller-AT, the Domain Series 3000 — which uses an IBM Personal Computer AT bus structure -- could only be linked to an Ethernet network through a Multibus-based Apollo system, Hatch said.

Etherbridge, Domain/Access and Transmission Control Protocol/Internet Protocol have been supported via the Multibus Ethernet connection and will also be supported over the new Ethercontroller-AT connection, Hatch said. Etherbridge provides transparent file use across Apollo nets linked via an Ethernet backbone. Domain/Access provides access from Domain workstations to Digital Equipment Corp. VAX computers running the VMS operating system. ◻

Avis from **page 6**

He cited Avis' undersea leased line to Puerto Rico's local telephone company as an example of the reliability problems some Avis sites have experienced with communications links. Five Avis locations in Puerto Rico are tied to the island's central office. "We have service outages every week. Generally, the reliability of the satellite links is better than that of the leased lines." Tittler said Avis plans to hook the Puerto Rico locations to the Vsat network.

Once completed, data traffic will be transmitted via satellite from an Avis site to Equatorial's shared hub earth station in Mountain View, Calif. Data will be collected there by an IBM 3725 front-end processor owned by Avis and located at the same site. Information will then be carried over 14.4K bit/sec leased lines, connecting the hub station to a second 3725 in the DP center here. Data sent from the Vsat to the hub station (inbound data) is transmitted at 1,200 bit/sec. Data transmitted from the hub to the remote Vsat is at 9.6K bit/sec.

> *"The reliability of the satellite links is better than that of the leased lines."*

Tittler said customer information entered into the Avis terminals would be sent to the DP center over satellite. The host computer would transmit all previously entered reservation information back across the network. Information about the type of car selected and payment would also be sent to the DP center, which, in turn, would send the data to the airport booth where the rental agreement would be printed. Each network round-trip would take roughly four seconds. ◻

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▶ MARKET MANEUVERS

Mitel offers ISDN chips

Aimed at interfacing voice/data gear.

BY JIM BROWN
New Products Editor

NEW YORK — Mitel Corp.'s Kanata, Ont.-based semiconductor division last week added a dozen new semiconductors to the widening array of chips designed to support Integrated Services Digital Network offerings.

The firm's ISDN chips are designed to interface various data and voice communications systems, private branch exchanges, T-1 multiplexers and other equipment to public ISDN facilities. Mitel said it intends to use the chips in its own line of telephone switching equipment, and it will market them to other vendors for use in their voice and data transmission devices.

The chip set complements Mitel's previously announced digital network interface circuit, known in ISDN lingo as the U interface. The U interface is the point of connection between user equipment and the public switched network.

Acceptance of the U interface by the American National Standards Institute's T1.D1.3 Committee paved the way for Mitel's introduction last week.

Included in the set are chips that support the basic ISDN 2B+D interface, which calls for carrying voice and data over two 64K bit/sec B channels and signaling information over a 16K bit/sec D channel, both contained in a single twisted-pair telephone wire.

The set also includes chips that support the U.S. 23B+D and European 30B+D primary ISDN interfaces. The primary rate calls for placing the signaling information currently included within the U.S. and European T-1 circuits on a single 64K bit/sec channel, leaving the remaining channels to carry digital voice or data transmissions.

More news: page 38

"Mitel announced what sounds like a fairly complete family of products for both the basic interface and the primary interface," said Ian Angus, president of the Toronto-based Angus TeleManagement Group, Inc.

Greg Carlsted, manager of voice and image for the telecommunications industry service of San Jose, Calif.-based Dataquest, Inc., lauded Mitel's aggressive campaign for product development. "It sounds to me like Mitel has done a tremendous amount of work and essentially has beaten most everybody to the punch," he said.

AT&T announced an ISDN chip last July, but Mitel's chip set is believed to offer more options than what AT&T has publicly announced. Last May, Northern Telecom, Inc. and Motorola, Inc. introduced a joint ISDN chip development pact. "Mitel is coming up against the big guys," Angus said.

Carlsted said market demand for the chips may be sluggish initially, but he added that the firm that makes the most graceful and quickest entry into the market stands to gain a greater share of the growing ISDN pot.

Angus also said Mitel's ISDN implementation may be better positioned for international use. He said Mitel's implementation will vary from that of other firms. "The 2B+D standard only settles what has to be solved, not how to solve it," Angus said. "One of the strengths Mitel does have is a lot of history in selling and developing products for both the North American and European markets," he added.

"In a funny sense, Mitel is going back to its roots," Angus continued. Mitel's first products in 1973 were tone receivers and tone-to-pulse adapters that allowed telephone companies to update older central office devices in order to handle newer push-button services.

In 1979, the company announced tone ringers that created the electronically generated telephone ringing that is now replacing the more traditional mechanical bell ringing.

▶ NET

T-1 mux firm plots stock sale

BY PAUL KORZENIOWSKI
Senior Editor

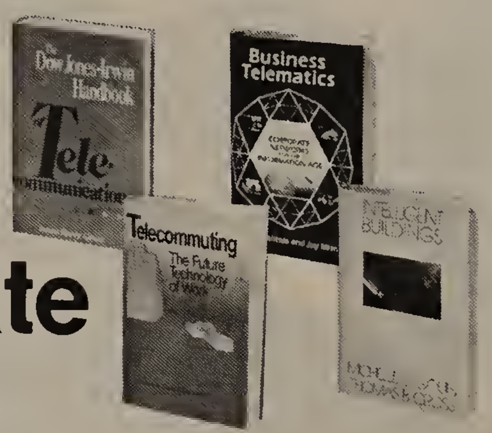
REDWOOD CITY, Calif. — Network Equipment Technologies Co. (NET), which has enjoyed a good deal of success to date in the T-1 multiplexer market, is now preparing for an initial stock offering, *Network World* has learned.

NET acknowledged last week that the company is currently in the midst of the so-called quiet period — a period during which company officials are constrained from making public comment — that precedes a stock offering. Neither the company nor analysts would estimate the amount of money to be raised by the offering, expected to take place within months.

Gartner Group, Inc., a market research firm based in Stamford, Conn., expects NET's revenue to rise to $25 million this year from $4 million last year.

Analysts speculated that once the offering is completed, NET will be looking to make further acquisitions. In August, the company purchased ComDesign, Inc., a company that markets low-speed multiplexers and wide-area network products.

NET reportedly has had preliminary conversations with a number of companies concerning a possible takeover. Some analysts speculated that NET would purchase another communications supplier, such as a modem manufacturer, in an effort to continue widening its communications offerings.



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NET 249

▶ TARIFF REVISION

Users group fights AT&T

BY MICHAEL FAHEY
Staff Writer

WASHINGTON, D.C. — A group representing some of the largest telecommunications users in the country has opposed an AT&T proposal to increase the charge levied on users that cancel orders for private lines prior to the start of service.

The Ad Hoc Telecommunications Users Committee recently petitioned the Federal Communications Commission to reject or suspend proposed AT&T revisions to FCC Tariffs 9 and 11 that would increase the cancellation charge. The group claims the increased charge would further boost what it says is an already excessive rate of return AT&T earns from private line service. The tariff changes are scheduled to take effect Nov. 9.

According to the committee's petition, the proposed revisions would increase AT&T's private line service rate of return to 14.8%. The committee maintains that, even without the revisions, AT&T's own data indicates the carriers' rate of return from private lines service is about 14.4%. AT&T's FCC-authorized rate of return for private line service is 12.75%.

The committee also charged in its petition that AT&T's proposed revisions are ambiguous and fail to specify information necessary to calculate cancellation charges.

Page Montgomery of Economics and Technology, a Boston-based consulting company retained by the ad hoc committee, said the group does not object to AT&T being paid for canceled private line service orders. He said the issue is one that affects resellers and other carriers more than end users.

"In any AT&T private line filing, the revenues should be consistent

See **Users** page 40

NETWORK WORLD

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INDUSTRY UPDATE

> “In the first half of 1986, the total value of all acquisitions and mergers in the computer industry providing a purchase price dropped 12% to $1.87 billion, down from a record-setting $2.1 billion for the same period in 1985. We are seeing a continued refocusing of corporate objectives to core-related businesses, the result being divestment of nonstrategic business units and product lines. The cash raised is being used to retire debt, finance other strategic acquisitions and repurchase stock.
>
> From **The Cerberus Report**
> The Cerberus Group
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NETWORK MERGER

Telenet swallows up Uninet users

Two value-added networks combine into one.

BY PAM POWERS
Senior Editor

RESTON, Va. — When United Telecommunications, Inc. and GTE Corp. joined to form US Sprint Communications Co. in July of this year, the value-added network divisions of the companies orchestrated a massive user migration to a single network.

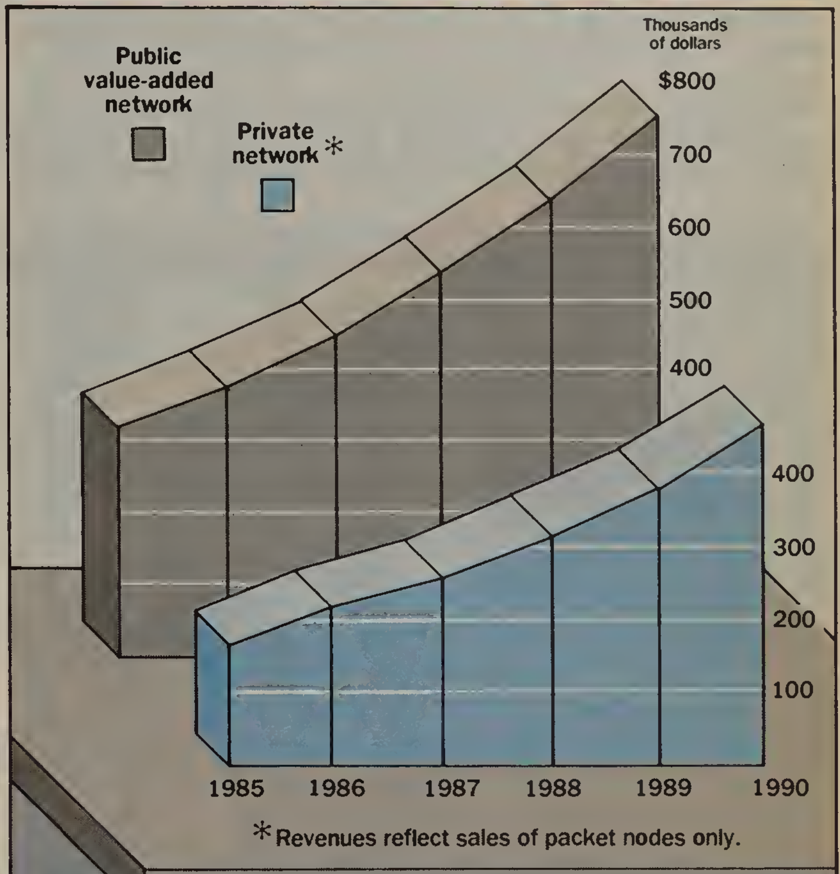
The job, now near its scheduled completion, has been carried out by Telenet Communications, US Sprint's value-added network division, with great success. But Telenet's task has been an unsung story, despite its complexity and the size of the user community affected.

Under the terms of the merger, the former United Telecommunications' Uninet packet-switching network service and GTE's Telenet network were merged into a single company, now called Telenet Communications, under US Sprint. The Network Services Business Unit of Telenet Communications, which the value-added network services fall under, is now headed by a mix of former Uninet and Telenet top executives. Tom Taylor, former Uninet president, now serves as senior vice-president in the new company. Tom Mangan, former Uninet vice-president of sales, has assumed the same position at Telenet. Sales staffs from the two companies are fully merged.

Plans for merging the two networks underwent some early changes. The original

See **Telenet** page 10

A forecast for packet-switching network markets



*Revenues reflect sales of packet nodes only.

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

INDUSTRY EYE
PAM POWERS

Vendors vie for packet-switch spoils

Despite optimistic forecasts, the private packet network market has underperformed in the past two years. Vendors are still waiting for large corporate accounts to filter in. After a buying spree in 1984, the Bell operating companies are assimilating new equipment and reassessing plans for packet services.

Packet switching is still a lucrative business to be in, but as the market gets tighter and more players participate, vendors will have to position themselves adroitly to catch the spoils.

Companies such as Tymnet, Inc., Telenet, Inc., BBN Communications Corp., M/A-Com, Inc. and Northern Telecom, Inc. dominate the private packet network business with complete product lines and end-to-end service and support. These venerable players have the market presence and the funds to maintain a comfortable market position, while keeping challengers at bay.

Yet, whether fearless or foolhardy, smaller companies with limited resources have joined their ranks. In their own small way, some have even been successful. Dynapac Packet Technology, Inc. and Memotec Datacom, Inc. are notable examples of companies that secured a niche by selling one portion of the networking whole. In this case, that portion is the sale of packet assemblers/disassemblers (PAD), which are boxes that provide protocol conversion and multiplexing functions at the interface to a private or public packet-switched network.

The idea makes perfect sense. The PAD business is distinct from the high-end systems business in terms of manufacturing, research and development, distribution and customer support. Specialization has its benefits, but smaller companies will have trouble against the likes of Telenet. Telenet manufactures its own PADs and has a large customer base in both the public value-added network and private network markets. One obvious answer for smaller companies is to strike OEM deals with the large network vendors.

In the sale of complete packet-switching private networks, companies such as Telematics, Inc., based in Ft. Lauderdale, Fla., have also burrowed a niche for themselves despite formidable competition.

In the past year, Dynapac also introduced its own network switch. Dynapac's name is revered in the PAD arena, but that doesn't ensure it a rose-strewn path to high-end sophisticated networking sales. Again, smaller companies will have difficulty competing for end-user business against the established names mentioned above, and salvation may lie in OEM and joint marketing arrangements. Telematics' early success is attributable to this strategy.

All of this is reminiscent of the early days when the BOCs had grandiose plans for packet-switched networks that would pull in hundreds of millions of dollars in revenue within a few years. Since those days, forecasted BOC services have been blushingly retired, and the few intra-local access and transport area services that do exist have produced faltering returns.

The mistake the BOCs made was to jump in with lofty ambitions and inflated market forecasts, only to discover the mar-

See **Packet nets** page 10

INTERNATIONAL

IBM to sell S. African subsidiary

BY PAM POWERS
Senior Editor

ARMONK, N.Y. — IBM will sell its 34-year-old South African subsidiary, the company announced last week, citing the deteriorating political and economic situation in that country.

IBM said it will sell the subsidiary to either local management or the entire employee population, which consists of some 1,500 people. About 15% are black. The new independent company will market IBM products and perhaps other suppliers' products as well.

IBM has maintained a policy of “social responsibility” toward South Africa in recent years of turmoil there. In 1985, IBM spent $15 million in grants to the nonwhite population for programs in education, business and legal reform.

Despite its apparent attempts to ameliorate the effects of apartheid, IBM said its freedom of action is about to be further limited by the political and social climate.

IBM said the new company will continue fair employment practices, including equal opportunity.

Telenet from **page 9**

intent to combine the two physically was abandoned when engineers deemed the effort too risky. Telenet and Uninet officials then decided to disband the Uninet network and migrate those users to existing Telenet facilities.

By July 1, the company had built in enough additional capacity on the network to assume a population approximately one-fifth again the size of the original Telenet population, according to a Telenet source. Telenet will not divulge the size of its user base. The majority of Uninet customers were information data base services with a user community of their own, according to Floyd Trogdon, vice-president and general manager of network services. Typically, these companies had two or three hard-wired connections to their host processors through the Uninet network, which had to be moved to Telenet.

Telenet first built gateways between the two networks, which accomplished two ends: the old Uninet network provided a backup in the event of technical problems; and end users could dial into either network during the transition period to access the hosts. Trogdon said that each individual user migration took between one and several days.

As Telenet previously charged users by the kilopacket and Uninet by kilocharacter, price changes were instituted with the migration. Users are now charged by the kilosegment, a measure commonly used in Europe. Trogdon said the company has taken pains to accommodate users. "In some cases, Uninet's pricing structure was lower than Telenet's. For customers of either service holding long-term agreements, we will honor until expiration the terms of those agreements," he said.

The combined companies have assumed considerable cost in the transition. Trogdon said that very few accounts were lost, but some short-term contracts were canceled, and some customers who used one network as the primary channel and the second as a backup now represent only one account.

Additionally, the Uninet network continues to incur costs in daily operations, although it no longer generates revenue for the company. That network will be shut down Nov. 1, upon completion of the migration. At that time, all transmission and backbone lines will be returned to the carriers from which they were leased, and most of the switching equipment of an older generation will be scrapped.

Trogdon said that Telenet encountered some typical problems during the the migration, but most were solved before they affected customers. "We've had amazingly few adverse comments about the migration," he said. "I'm optimistic that when we look back on this after Nov. 1, we'll say it was a highly successful operation. I'm looking forward to celebrating." ◻

Packet nets from **page 9**

ket wasn't quite the gold mine it was cracked up to be.

Let that be fair warning to the rest. The year of the corporate private packet net is coming; it may be 1987. And the potential size of the market leaves room for quite a few companies to make healthy profits.

But as is the case in other equipment markets, consolidation is close at hand. Even large companies such as NEC America, Inc. and Paradyne Corp. haven't prospered in this market.

Smaller companies, with single product lines or limited service and support functions, may profit by selling products to other vendors for resale as a complete system. Otherwise, the pickings could be slim, because the playing field is looking a little crowded. ◻

PROFIT & LOSS

AT&T reported preliminary third quarter earnings of $533 million, or 48 cents per share, up from $378 million, or 33 cents per share from third quarter 1985. Revenues were $8.427 billion, down from $8.658 billion last year. Costs and expenses were down 5% from the year earlier; product sales were 12.6% lower, while services revenues were up 7.2%.

$

BellSouth Corp. reported third quarter earnings of $2.89 billion, up 5.9% from third quarter 1985. Revenue increased 8.7% to $8.62 billion.

$

Southwestern Bell Corp. reported a 5.4% increase in third-quarter earnings but a decline in revenues to $1.96 billion from $1.99 billion third quarter 1985.

$

US West, Inc. revenues rose 8.7% from $1.97 billion to $2.14 billion. Earnings also rose by 6.1%.

$

Amdahl Corp. posted a drop in revenues to $220.02 million from $221.1 million in third quarter 1985. Net income rose to $7.1 million or 15 cents per share, up from $5.7 million for the same period last year. The company attributes improved earnings to shipment of its new 5890-300 processor. ◻

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TELECOM TRENDS

Argo tests 56K bit/sec service

Argo Communications Corp. of New Rochelle, N.Y., announced it has successfully completed a trial of its switched 56K bit/sec digital communications service. The test, which was sponsored by Bell Communications Research, Inc. in conjunction with other carriers, linked Argo's central office switches with local carriers in San Francisco, Chicago and New York.

CIRCUIT ROUTING INTELLIGENCE

AT&T scores net capacity coup

BY JOHN DIX
Senior Editor

AT&T is increasing the capacity of its network without adding switches or transmission facilities, a technical feat that will save the company an estimated $500 million in construction costs over the next 10 years.

The network upgrade, Dynamic Non-Hierarchical Routing (DNHR), involves installation of new switch software that adds increased circuit routing intelligence. In effect, the software will enable the network to support heavier call loads without adding equipment.

Leveraging its installed equipment base will enable AT&T to minimize future capital expenditures, bringing pressure to bear on other carriers. Competitors trying to maintain rates below AT&T's price umbrella may have their already tight profit margins squeezed if AT&T's savings are reflected in lower tariff rates.

The DNHR concept is relatively easy to understand. If, for example, AT&T's main trunks are congested between New York and Atlanta, network switches today know how to route calls to surrounding cities and towns in an attempt to sneak calls in through a side or back door.

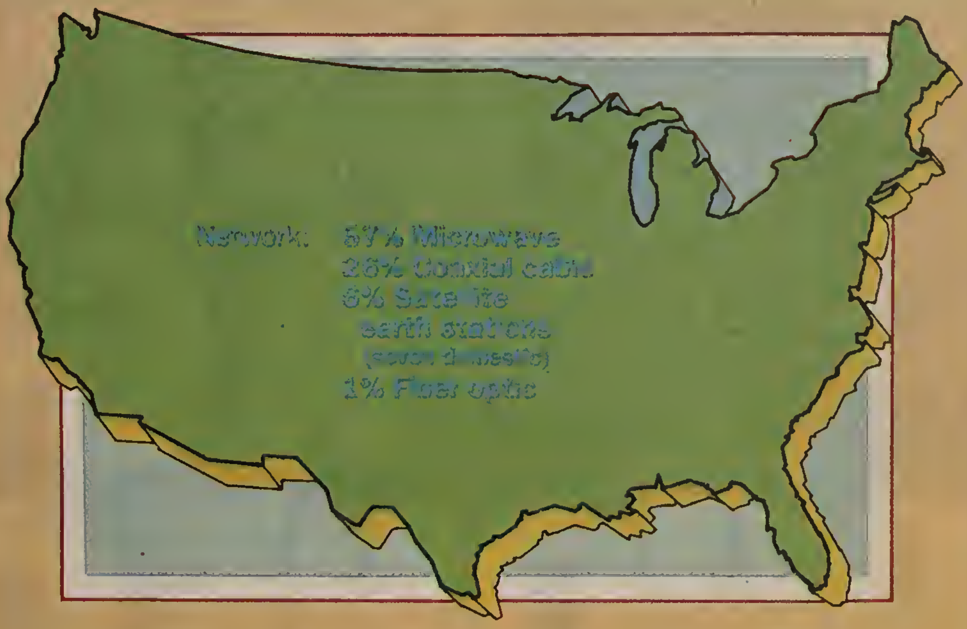
DNHR expands that circuit routing intelligence by adding 16 additional ways that calls can be completed. Using the same example, DNHR would enable calls from New York to Atlanta to be routed through the Midwest if necessary.

This example shows how time zone differences can be exploited. DNHR will also enable AT&T to change network routing patterns, depending on time of day, day of week and special holidays.

Bell Laboratories estimates that DNHR will save AT&T $500 million in construction costs over 10 years by enabling the company to support a growing number of calls without having to add facilities to the network.

The DNHR upgrade is scheduled to be completed in 1987. Sixty-six switches will be converted by next year. ◪

AT&T: network snapshot



One hundred seventy-two switches in network, 100 of which are 4ESS switches capable of handling 550,000 calls per hour.

Twenty-five of the 100 4EES switches have been converted to support Dynamic Non-Hierarchical Routing (DNHR). Sixty-six will be converted by next year, and the rest are expected to be upgraded by 1987. AT&T Bell Laboratories estimates that DNHR will save AT&T $500 million in construction costs over the next 10 years.

CROSS TALK

JOHN DIX

Fowler's deregulation design sets fur flying

The prospect of complete deregulation of local telephone companies, as proposed by Federal Communications Commission Chairman Mark Fowler in a recent law journal article, is creating a stir.

At stake, depending on whom you listen to, are universal service, national security and the American way.

The *Federal Communications Law Journal* article, meant to encourage discussion of a future without regulation, proposes a trial period for local telephone company deregulation beginning in the 1990s. Ten states have reportedly expressed interest in participating in the experiment.

It is hard to pick sides in the deregulation battle. The long-haul carriers fight to keep the locals regulated and vice versa.

But the locals seem to be winning. They have already entered into more markets than the Department of Justice and AT&T probably imagined possible when they hammered out the Consent Decree that resulted in divestiture.

And despite the threat of bypass, the long-distance carriers face far more competition than any of the local telephone companies. Bypass, in fact, may be a stalking-horse used by the locals to distract the industry while they start up new ventures.

Perhaps by 1990, the environment may have changed significantly enough to make Fowler's idea feasible. If, however, the locals still retain domination of local loop facilities as they do today, deregulation would be premature.

Control of this network bottleneck would give the local telephone companies too much sway in critical markets.

POSTDIVESTITURE

BellSouth is busting out

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — BellSouth Corp. is making the most of its independence from Ma Bell.

The firm has been among the most active of the divested Bell operating companies entering new, nonregulated businesses. To date, the company has entered 13 new businesses and is planning to start two additional ventures.

These new activities include customer premises equipment, shared tenant services, real estate, cellular telephone service, publishing and advertising.

Within the past month, three new companies have been started. BellSouth Government Systems, Inc. was officially incorporated and is beginning to sell service and equipment to the federal marketplace. In addition, BellSouth Advanced Network, Inc. and BellSouth Information Services, Inc. were recently incorporated to serve the data communications needs of corporate customers.

Advanced Network is a high-volume packet-switching and protocol conversion service linking BellSouth's region. The company hopes to link this service with nationwide value-added network carriers.

Information Services was formed to provide telecommunications support and consulting to corporate MIS departments.

In the future, BellSouth hopes to start a software company that will provide customized support for users of its customer premises equipment and to open a Washington, D.C. branch office to market customer premises equipment to commercial accounts.

BellSouth Enterprises, Inc., the holding company for nonregulated businesses, has yet to turn a profit, but the company said it is willing to give these ventures a chance to develop, even if federal regulators do away with separate subsidiary requirements.

Interestingly, Vernon Jobson, vice-president of the Communications Systems Group within the Enterprises organization, said, "We won't move these units back into the parent company if Computer III does away with structural separations, at least not immediately." ◪

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DATA DELIVERY

> “The excess of venture capital in the communications industry has diminished. A major surprise at the recent Tele-Communications Association show was the lack of new entrants.
>
> **From a report by Alex. Brown & Sons, Inc.**
> **Baltimore, Md.**

DATA TRANSMISSION

EF Hutton talks about moving data

Firm beta tests new bulk transfer tool.

BY PAUL KORZENIOWSKI
Senior Editor

NEW YORK — When E.F. Hutton & Co., Inc. talks about moving large amounts of data, other large companies should listen.

Counterparts may benefit from lessons the financial company learned when it linked two of its data centers. As part of its lesson, E.F. Hutton became a beta site for a bulk data transfer package from a start-up company located in Irving, Texas.

A year and a half ago, E.F. Hutton tied its primary data center, which houses two IBM 3080 series mainframes, to a backup center located a few blocks away. The backup center is also equipped with two IBM mainframes.

When the company looked for a means of tying the two centers together, it turned first to IBM. IBM offered a software package for moving large amounts of data, its Bulk Data Transfer facility, as well as its 3275 front-end processors, which could support a T-1 connection between the two sites.

E.F. Hutton took IBM's advice but was not satisfied with the results. Exchanging large amounts of data was expensive and cumbersome, according to Gary Hegedus, vice-president at E.F. Hutton. IBM's front-end processors were not designed to work with T-1 lines. Interfaces between the processors and the line often did not function at the maximum speed of T-1, namely 1.54M bit/sec. Also, E.F. Hutton needed to transfer data at speeds faster than T-1, and IBM front-end processors cannot support higher speeds.

See **E.F. Hutton** page 16

DATA DIALOGUE

ERIC H. KILLORIN

What APPC promises users

Advanced Program-to-Program Communications (APPC), often referred to as LU 6.2, is an IBM building block that will allow users on various processors to communicate with each other on a peer-to-peer basis.

APPC is destined to change the way end users communicate in a Systems Network Architecture environment.

Earlier implementations of SNA defined communications in a rigid, hierarchical structure, which recognized workstations as unintelligent devices without local processing power.

When communicating with a host, terminals and Personal Computers acted like slaves to that host. The mainframe polled all devices for requests to send or receive data.

Workstations were unable to initiate sessions with the host and were unable to communicate between themselves.

In an SNA hierarchy, peripheral devices and hosts are defined as Physical Units, which are nodes in an SNA network. PUs define each node's communications capabilities.

For example, PU 2.0s are typically terminals and PU 4.0s are communications front-end processors.

Dedicated to certain PUs were Logical Units, designated as LUs. PUs contain the network services required by their associated LUs, including routing messages to and from associated LUs and managing Synchronous Data Link Control links to a mainframe.

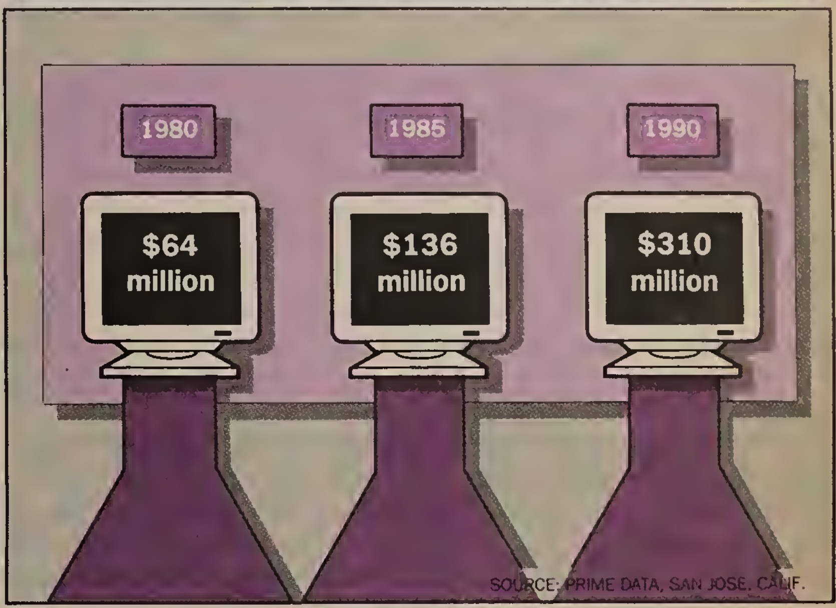
LUs are presentation services for SNA network users. LUs include microcomputer

See **APPC** page 16

> *“When communicating with a host, terminals and Personal Computers acted like slaves to that host.”*

Killorin is publisher of PC Netline, *an industry newsletter, and president of Hyatt Research Corp., both based in Andover, Mass.*

Protocol analyzer market



SOURCE: PRIME DATA, SAN JOSE, CALIF.

PROTOCOL ANALYZERS

Hewlett-Packard beefs up line

BY PAUL KORZENIOWSKI
Senior Editor

COLORADO SPRINGS — Hewlett-Packard Co. last week attempted to strengthen its No. 1 position in the protocol analyzer market with a slew of new products and enhancements to existing offerings.

HP unveiled three Systems Network Architecture software products that run on one model of its protocol analyzer line, software for its local-area network protocol analyzer and a portable protocol analyzer.

Prime Data, a market research firm in San Jose, Calif., said that HP is one step in front of Atlantic Research Corp. in the protocol analyzer race. Both companies are well ahead of the rest of the pack, which includes Tekelec, Inc., Digilog, Inc., Digitech, Inc. and Tektronix, Inc.

The SNA software works in conjunction with the company's HP 4953A protocol analyzer, which has been enhanced to support 512K bytes of random-access memory.

The first module, SNA Emulation Language, enables a user to develop custom SNA test sequences. The language works with standard SNA mnemonics, which frees the user from analyzing bit-level messages. With the product, a user can test for Synchronous Data Link Control and Path Control layer emulation.

The SNA 3270 Device Exerciser enables a user to set up tests that will mimic a 3270 series device. The SNA 3270 device exerciser can be used for IBM 3274 and 3276 cluster controllers, IBM 3278 and 3279 terminals and 3287 and 3289 printers.

A user can perform more than 240 tests, and the tests can be customized because the source code is supplied with the product. Tests can be run individually or in sequence.

HP claimed that it is the first company to offer an SNA LU 6.2 analyzer as a stand-alone device. The SNA LU 6.2 Node Exerciser can be used to test applications developed for IBM's peer-to-peer network protocol. A user can test all LU 6.2 verbs and can interactively test half session and presentation services operations.

An HP 4953A with all three software modules installed costs $19,450. The SNA Emulation Language sells for $2,500, the 3270 SNA Device Exerciser costs $1,000 and the SNA LU 6.2 Node Exerciser is priced at $2,000.

Prime Data said that the protocol analyzer market would grow at an average compound annual rate of 18%

See **HP** page 16

E.F. Hutton from **page 15**

Vtam, IBM's primary telecommunications software, has limited bulk data transfer capabilities. The software could not support data sent in block sizes larger than 32K bytes, and E.F. Hutton typically wanted to send blocks larger than that. The result was that applications would quickly fill up Vtam's common storage area, which acts as a buffer, to further slow data transfer.

When the data sites were linked, E.F. Hutton was working with Vtam Release 2.0. Some of the buffer problems were solved by Vtam 3.0, which the company has installed.

But Hegedus said that the company still ran into buffer storage problems. IBM also announced a new Bulk Data File Transfer program, but Hegedus said that it did not have enough horsepower for his company either.

Rather than sticking with a true-blue approach, E.F. Hutton decided to test a new product from The Systems Center, a start-up firm in Irving, Texas. The Systems Center has a line of products, called Network Datamover, designed for various types of file transfers.

> *"E.F. Hutton has been working with The Systems Center product for seven months, and Hegedus is satisfied with it."*

E.F. Hutton was interested in Network Datamover MVS/Netex. This product worked with Network Systems Corp.'s Hyperchannel, a channel-to-channel attachment, and enabled E.F. Hutton to connect mainframe channels at the two data centers and bypass Vtam.

E.F. Hutton secured a T-3 line from Western Union Corp. and used it as the transmission line between the two mainframe channels. T-3 works with fiber-optic transmission lines and operates at speeds up to 45M bit/sec. Hegedus reported no problems securing the T-3 line from Western Union, which also maintains the connection.

In addition to supporting higher transmission speeds, Network Datamover supplies an audit trail, a feature not found in IBM's offerings.

E.F. Hutton has not totally abandoned IBM's approach, however. The financial company has two T-1 links and associated IBM 3275s connecting its data centers.

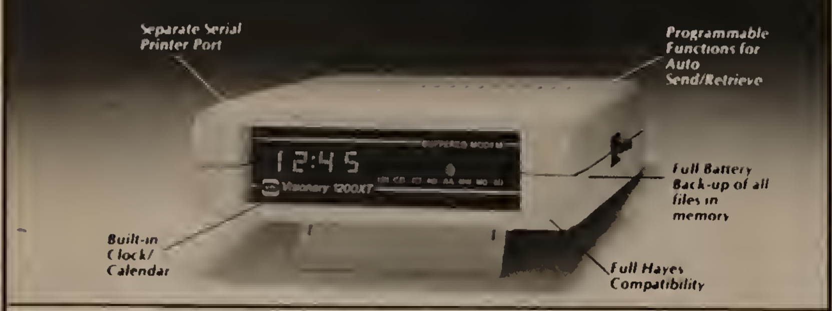
These links are used as backup in case the T-3 link between the two sites goes down, according to Hegedus. When the company uses Network Datamover MVS/Netex in this manner, it runs an application program under IBM's MVS operating system.

E.F. Hutton has been working with The Systems Center product for seven months, and Hegedus is satisfied with it.

"I was surprised at how easy it was to install the product," he said. He reported none of the problems typically associated with beta testing a new product.

Hegedus added that The Systems Center software costs approximately $40,000. A comparable IBM approach would cost close to $250,000.

THE VISIONARY 1200XT Communications Controller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12:45
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APPC from **page 15**

and mainframe applications programs.

LUs are bound to a specific data or character stream. The most common is LU Type 2, a 3270 data stream for display terminals such as the 3278. Other streams include LU Type 1, an SNA character stream for data processing, and LU Type 3, a 3270 data stream for printers.

LU 6.2 provides a connection between application programs and network resources. Its central function is resource allocation and control.

With LU 6.2, applications programs will be able to communicate with each other regardless of the processor the programs reside in or the operating system employed by that processor.

This protocol makes hardware and operating system transparent for communications.

In this environment, a user at a device defined as PU 2.1, a universal device type, can establish a logical connection between LUs. Once the physical connection is made, applications in either device can initiate a conversation.

LU 6.2 supports transaction programs through a protocol boundary or Application Program Interface. Application software is written for one type of service and doesn't have to be written for a primary end or a secondary end.

The protocol boundary is a generic interface between transaction programs and an SNA network. It permits access to SNA services and resources and allows transaction programs to communicate without being involved with the networking tasks that ensure that the communication takes place.

Unlike earlier LUs, LU 6.2 isn't designed to carry one specific data stream and it can carry any type of data in any type of data stream, for example asynchronous or synchronous.

> *"Users have too much invested in their existing hardware and software to jump ship."*

IBM processors and systems that currently support LU 6.2 include hosts running CICS, 5520 Administration System, System/34, System/36, System/38, Displaywriter, Scanmaster, Pageprinter, Series/1 and the Personal Computer line.

APPC/PC is the implementation of LU 6.2 and PU 2.1 for the IBM Personal Computer family. Any PC application written to this protocol can communicate with no other APPC application on an SNA network, regardless of the operating system employed by the processor running the application.

Applications development for this environment will be a lengthy process because the code is complex.

The evolution of LU 6.2 will be gradual. When IBM announced Binary Synchronous Communications, users only slowly moved to that standard. Users have too much invested in their existing hardware and software to jump ship.

Also, a hierarchical networking environment is desirable in many circumstances. The real promise of APPC is its ability to provide distributed processing in a network of Personal Computers, minicomputers and hosts. APPC will be widely accepted for those applications.

HP from **page 15**

for the next five years. The market grew at a rate of only 16% last year. Galen Wampler, president of Prime Data, said that the healthier growth rate will stem from the use of protocol analyzers in local-area networks.

HP debuted performance analysis software for its Ethernet local-area net analyzer. The software runs on the HP 4971S protocol analyzer, which was supplied with a new operating system.

With the company's Ethernet performance analysis package, network managers are able to monitor network traffic, measure utilization, channel acquisition and network delay times. They can also determine network performance, which can be used for capacity planning.

The software features events triggered reporting with automatic sequence and alarm features. A user can monitor performance analysis on a remote local-area network. Performance information can be sent in graphic or tabular form to a printer or a plotter. The software costs $2,000.

The 15-pound HP 4952A was designed as a portable protocol analyzer. The device can support up to 750K bytes of random-access memory and a 64K bit/sec digital line.

The HP 4952A can be used for X.25, SNA and remote testing. A cursor timing feature measures time between events in a data capture buffer. The device costs $7,000.

> *"HP announced performance analysis software for its Ethernet local-area network analyzer."*

NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS AND SERVICES

Is networking your strategic weapon?

If you're an innovative network user, you deserve national recognition. Get into the running for Network World's second annual User Excellence Award.

You've heard it before. To gain an edge on fierce domestic and international competitors, your network has to be more than just a communications system. It has to be a strategic weapon.

If you're doing more than just talking about networking as a strategic weapon, *Network World* wants to hear from you. We're looking for leading edge network users — users employing state-of-the-art communications technologies and innovative management techniques — as candidates for our second annual User Excellence Award. We want to uncover the best and the brightest of the networking world and give them the recognition they deserve.

You've already done the hard part, building a leading edge network. The rest is easy. Just fill out the survey below and return it to us postmarked no later than Nov. 17. Based on a review of the responses, we'll select our networking superstars. The winner of the second annual User Excellence Award, and others whose efforts are worthy of mention, will be featured in the Dec. 1 issue of Network World.

COMPANY PROFILE

1. What was your company's total revenue for 1985? ________

2. Please estimate your company's total revenue for 1986. ________

3. What is your company's total communications budget for 1986?
☐ Under $500,000
☐ $500,000 to $1 million
☐ $1 million to $5 million
☐ $5 million to $10 million
☐ $10 million to $20 million
☐ Over $20 million

By what percentage do you estimate the total budgetwill increase for 1987? ________

4. Please estimate the percentage of your total communications budget allocated to:

	Example	1985	1986
Voice communications equipment and services:	45%	____	____
Data communications equipment and services:	55%	____	____

MANAGEMENT

5. Does your company have a separate communications department? ________

6. Does that department have budgetary responsibility for both voice and data communications expenditures? ________

7. What is the title of the department head? ________

8. To whom does the department head report? ________

9. Does the department head have equal status with the MIS or data processing manager? ________

10. Are corporate departments charged for communications services? ________

11. Is there someone in your organization assigned to monitor regulatory matters such as Federal Communications Commission actions? ________

12. Tariff changes? ________

13. Please indicate the size of your total communications staff. ________

How many staff members are primarily involved with data communications? ________
With voice communications? ________

14. Do you configure your network for cost and performance using optimization software, systems or services? ________

CORPORATE NETWORK

15. Please estimate the number of corporate sites supported by the following:
☐ Private branch exchanges ________
☐ Centrex services ________

16. Do you use PBXs to support terminal-to-host links or to network personal computers? ________

17. If a Centrex user, do you use the service to support terminal-to-host links or to network personal computers? ________

18. Please estimate the percentage of your voice and data traffic carried by the following services:

VOICE

☐ Direct Distance Dial ________
☐ Bulk calling services (for example, Wats, 800 Service, Megacom) ________
☐ Virtual networks (for example, AT&T's Software Defined Network) ________
☐ Leased analog facilities ________
☐ T-1 facilities ________
☐ Private satellite ________
☐ Other (explain) ________
100%:Total

DATA

☐ Direct Distance Dial ________
☐ Bulk calling services (for example, Wats, 800 Service, Megacom) ________
☐ Virtual networks (for example, AT&T's Software Defined Network) ________
☐ Leased analog facilities ________
☐ Digital data services ________
☐ T-1 facilities ________
☐ Very small aperture terminal network ________
☐ Private satellite network ________
☐ Packet switching services ________
☐ Private packet switched network ________
☐ Other (explain) ________
100%:Total

19. Please estimate the percentage of your network traffic carried by:
☐ AT&T ________
☐ MCI Communications Corp ________
☐ US Sprint Communications Co. ________
☐ Other carriers (Please identify) ________

20. Which of the following bypass methods does your company employ?
☐ Private satellite network ________
☐ Point-to-point microwave facilities ________
☐ Infrared transmission systems ________
☐ Other (describe) ________

21. If you are a T-1 user, do your T-1 multiplexers support advanced capabilities such as switching, dynamic bandwidth allocation and network management? ________

22. Do you have network backup facilities and equipment? ________

23. How many local-area networks do you have installed? ________

DATA PROCESSING

24. Is your data processing network based on a proprietary vendor architecture?
If so, is it:
☐ IBM Systems Network Architecture ________
☐ Digital Equipment Corp. Decnet ________
☐ Other (explain) ________

25. Do you provide micro users with access to mainframe resources? ________

If yes, please explain: ________

26. How many mainframes are installed throughout your corporate network? ________
Minicomputers? ________
Microcomputers? ________
Front-end processors? ________

27. Do you use gateways to support communications between minicomputers and mainframes from different vendors? ________

If your company would like to be considered for Network World's second annual User Excellence Award, please answer the following question:

How is your company using networking as a strategic weapon? (Please use space provided on the reverse side of this form for comments.)

Name ________
Title ________
Company name ________
Address ________
Phone number ________

Is networking your strategic weapon?

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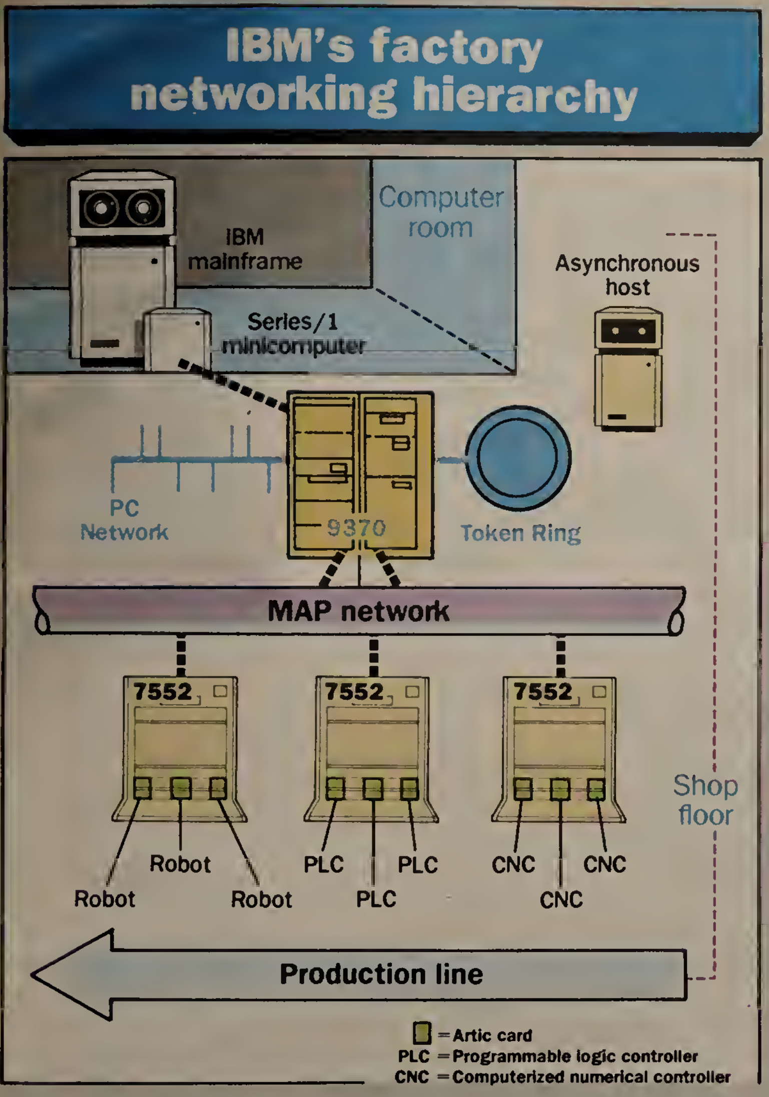
Comments:

FACTORY COMMUNICATIONS

Automach canceled

Automach, a four-day factory automation conference that was to be held next July in Sydney, Australia, has been canceled. A spokesman for the Society of Manufacturing Engineers said, "Economic conditions forced sponsors to halt the show." The assemblage would have enabled Australian engineers to view the latest factory automation technology.



IBM's 9370 information system will be used to address the need for an intermediate processor that would be placed between cell controllers and the factory's computer room mainframe. The interface between the 9370 and the MAP network is under development.

INDUSTRY INSIDER

Sperry to peddle INI's MAP network

Mainframe maker expected to ink OEM deal.

BY BOB WALLACE
Senior Writer

BLUE BELL, Pa. — Sperry Corp., a mainframe computer manufacturer based here, is hoping to build on its processors' presence in production plants by packaging its computers with a local-area network that is compatible with the Manufacturing Automation Protocol.

Network World has learned Sperry is working to finalize an OEM agreement with Industrial Networking, Inc. (INI) to vend Sperry's computer line with INI's MAP/One local-area network.

A source within Sperry claimed the marketing pact, if finalized, would take effect beginning in January 1987.

An INI spokeswoman confirmed that discussions between INI and Sperry are currently under way, but she declined to discuss details of the proposed agreement.

> *"Sperry is working on an OEM pact with INI to vend Sperry's computer line with INI's MAP/One."*

Sperry would not say which of its computers might be packaged with the INI network.

Sperry's relationship with INI is expected to be highlighted at Autofact '86, one of the nation's largest automation conferences, to be held Nov. 11 to 14 in Detroit.

At Autofact, Sperry will operate a multivendor networking demonstration that will use INI's MAP/One broadband local-area net to link engineering and manu-

See **Sperry** page 18

INCIDENTALS

Plant managers discussing in-
allation of the recently an-
ounced IBM 9370 information sys-
m in their factories should be
ware that the four versions of
ese systems are not targeted for
eneral availability until the sec-
nd half of 1987. The low-end Mod-
l 20 will cost roughly $60,000
ithout the unit's operating sys-
m. A fully configured Model 20,
quipped with an operating sys-
m, terminals and maintenance
ervices, will likely cost $150,000
$250,000.

* * *

Relcom, Inc., of Forest Grove,
re., is offering a handbook that
xplains how carrier-band Manu-
acturing Automation Protocol net-
orks operate. The eight-chapter
aperback, which costs $20, dis-
usses the current state of carrier-
and technology and anticipates
uture improvements in the specifi-
ation of factory subnetworks. For
dditional information on the
andbook, contact Relcom at (503)
57-5607.

* * *

Scientific Systems, Inc. of Cam-
ridge, Mass., recently signed a

See **Incidentals** page 18

FACTORY FACTS

BOB WALLACE

IBM slips into a pair of user shoes

The nation's largest computer and networking equipment vendors are also some of the largest users of factory networking gear.

Several vendor/users have already installed advanced manufacturing systems and may be better qualified to speak on topics of factory automation and Computer-Integrated Manufacturing (CIM) than large users.

IBM is one such vendor/user, operating 46 manufacturing facilities around the world.

The company has struggled to coordinate the factory automation efforts of individual plant managers as a first step toward realization of CIM.

IBM established the Manufacturing Technology Center, which is a group of several hundred people who understand the vendor/user's internal manufacturing requirements and have contacts with key personnel at IBM factories worldwide.

John Klein, general manager of manufacturing systems products at IBM, said that the responsibility of this group, which works with IBM's corporate manufacturing department, is to understand how IBM's internal CIM strategy can best be applied to IBM's manufacturing sites.

"In the past, we had a very, very loose relationship between the plant managers at individual IBM factories," Klein recalled.

"The person responsible for the profitability of that site had been entrusted with making all the decisions relative to the implementation of manufacturing products," he said. "What has happened over the years with this approach is various sites have implemented various solutions differently — and that's somewhat bad."

As part of its "use what we sell, sell what we use" approach to manufacturing, Klein and others have developed an overall manufacturing strategy and have set up task forces charged with identifying standards for specific types of automation equipment.

Rodolfo Salas, IBM's manufacturing industries director, says that IBM undertook a self-assessment, which included the exploration of IBM's relationship as a user with suppliers, its use of direct labor and how the company is structurally organized.

"We concluded that when you look at CIM, you must look at it as an enterprisewide solution, not as a single factory solution."

Salas said he has discovered three keys to implementing CIM by studying IBM's manufacturing operations and manufacturers that are implementing CIM in an enterprisewide manner.

Control the corporation's manufacturing infrastructure. "These companies control their relationships with suppliers that

See **IBM** page 18

Sperry from **page 17**

facturing offices with a factory floor network.

Networking hardware and software and peripheral devices provided by Burroughs Corp., Novell, Inc., and Ungermann-Bass, Inc. will be showcased in the demonstration.

Factory floor use

The Sperry source said the OEM agreement, once finalized, would increase use of Sperry computers on the factory floor.

International Data Corp. (IDC), a Framingham, Mass.-based market research and consulting firm, claimed a large portion of Sperry's large-scale computing system sales are to manufacturers.

The group explained that 20.5% of Sperry's large computing systems are used in manufacturing applications. IDC added, however, that this 20.5% of Sperry system sales represents only 2.2% of large computing systems sold to manufacturers.

OEM strategy

Sperry's planned OEM strategy is one that many other computer manufacturers have already chosen.

IBM, Data General Corp. and Prime Computer, Inc. are a few examples of companies that have gone the OEM route to codevelop or acquire software or hardware that will link their processors to MAP-compatible factory nets.

Incidentals from **page 17**

marketing agreement with Allen-Bradley Co.'s Customer Support Services division that will allow Allen-Bradley to market Scientific Systems' computer-based MAP training products. The first course, "MAP-Facts Advanced Concepts," will be ready for shipment next month. The software program will run on IBM Personal Computers and compatibles.

This course discusses the development of factory floor communications methods and their limitations. The course was provided by Glenn Yeager of Integrated Automation Consulting, an Ypsilanti, Mich.-based firm.

For additional information on the courses, contact Scientific Systems at (617) 661-6364.

* * *

The Society of Manufacturing Engineers (SME) has announced a 400-page book entitled "Automated Assembly." The book explains how to achieve low-cost assembly by adopting, modifying and evaluating new technologies and processes. The book also assesses new automation alternatives available through advances in industrial robotics and vision technology. To order the book, which costs $42, contact SME at (313) 271-1500, ext. 418 or 419.

* * *

The Robotics International (RI) group of SME and SME will cosponsor a three-day workshop on robotics for educators. For additional information on the course, which will be held Dec. 2 to 4 at the Marriott-Nashville in Nashville, Tenn., contact RI/SME at (313) 271-0039.

* * *

Those wishing to attend the Automated Manufacturing 1986 (AM86) show to be held Nov. 3 to 6 in Greenville, S.C., should contact AM86 conference headquarters at (803) 242-3170. Lester Thurow and Joseph Engleberger will speak at the assemblage. Thurow is a professor of Economics and Business Management at the Massachusetts Institute of Technology. Engelberger is the founder and was the first president of Unimation, Inc., a robot manufacturer.

* * *

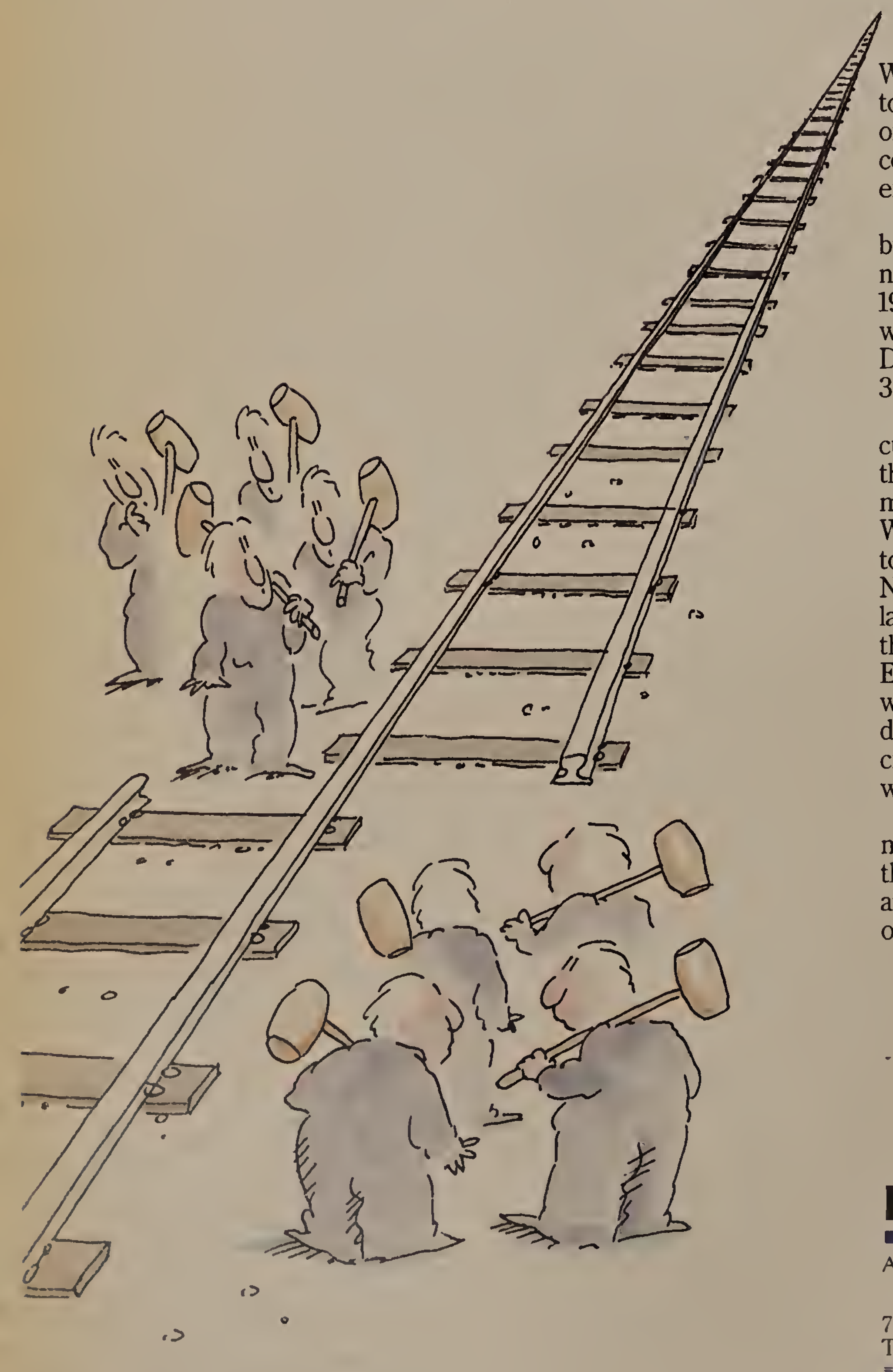
Automation Resource Group, a Wellesley, Mass.-based manufacturing research firm has released a study that claims cell controllers are the key to flexible manufacturing. Those interested in obtaining a copy of the study should contact Automation Research Group at (617) 785-0900.

IBM from **page 17**

provide materials to be used in manufacturing operations. These companies also adhere to production schedules and deliver quality products on time," Salas said.

Design products for ease of manufacturing. The restructuring of IBM's relationship with the companies that supply components for the production of IBM's small printers has simplified a complex production process. Salas said IBM had drastically reduced the number of suppliers of printer components, from 740 to 75. "We also negotiated to have the printers half built before they reach our manufacturing facilities," he said.

Pay exceptional attention to your customers. Salas cited IBM's Fishkill, N.Y., factory as an operation that permits computer chips to be modified and tailored to meet individual customer specifications in only three days. Only 18 days elapse between the beginning of the redesign of the product and the actual shipment of the completed product, he maintained. "[U.S. manufacturers] used to think they could build products and then get customers to buy them," Salas explained. "Now we have to build products the customers want."



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But the U.S. Government isn't the only customer with tough networking problems that BBN has helped to solve. Numerous major corporations, among them Wang, Weyerhaeuser, and MasterCard, not to mention European giants like England's National Westminster Bank and Italy's largest corporation, ENI, have also found the answers they were looking for from us. Each came to BBN with a unique networking problem—from integrated voice/data transmission to electronic mail to credit authorization—and each came away with a unique networking solution.

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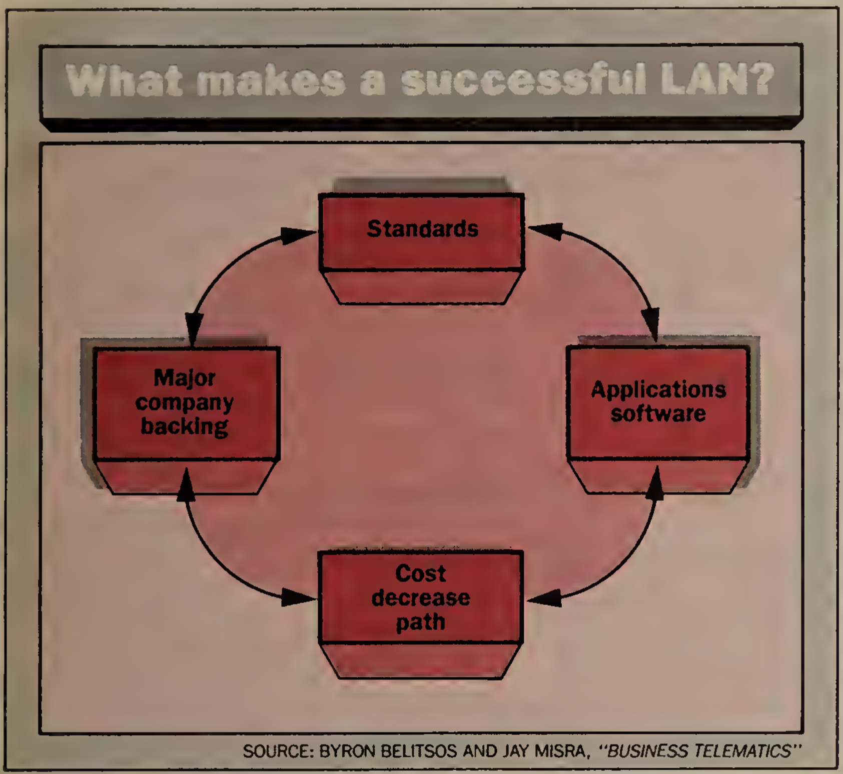
COMMUNICATIONS MANAGER

Achievement award

American Management Systems, Inc. (AMS) and the Graduate School of Industrial Administration of Carnegie-Mellon University announced that they will cosponsor the Award for Achievement in managing information technology. The award will recognize professionals making outstanding contributions to their organizations through effective use of computer and communications technology. For more information call Jan Dodson of AMS at (703) 841-5830.


What makes a successful LAN?

SOURCE: BYRON BELITSOS AND JAY MISRA, *"BUSINESS TELEMATICS"*

INTEGRATED NETS

Canada wires Parliament area

BY MARGIE SEMILOF
Senior Writer

OTTAWA — The Canadian Parliament, housed in a historic, nine-building complex here, has mixed old-world Gothic-style architecture and new-world technology in crafting an audio, data and video network that provides a wealth of services to users.

Completed in May 1984, the backbone of the Parliament's $6 million [Canada] Oasis project is a 450-MHz double dual, broadband local-area network that carries 128 channels at an aggregate data rate of 2M bit/sec. The coaxial cable network interconnects the buildings within Ottawa's downtown Parliamentary district, which include the House of Commons, Senate, administrative offices and library facilities.

The network serves approximately 1,400 users, including House of Commons

See **Parliament** page 20

MANAGEMENT INSIGHTS

The joys of delegating

A feeling of teamwork is essential.

BY CHARLES KAHN
Special to Network World

In the highly competitive communications industry, engineering, production and marketing decisions must be converted to action swiftly. Such action has to be divided into components that are then delegated to knowledgeable subordinates, freeing managers to focus their energies on the most crucial, high-priority situations.

Fundamental to good management and critical to a healthy corporate environment, the concept of delegation must be accepted as an important function in administering an operation.

Because of the industry's technical orientation, delegation often takes place in an environment of project management. The company puts together a team of specialists for a limited time to achieve a specific goal. Often the project manager has less than full authority over personnel who may be assigned only part-time to the project. With no authority to reward people, project managers must find ways of increasing their authority and minimizing the "authority gap."

Perhaps the most effective approach to minimizing this gap is not to rely on authority or a reward procedure. Each subordinate must be made to feel that his contribution is essential to the project. This is accomplished by listening to ideas and evaluating them. If an idea is to be used, credit should be given immediately. A rejected idea should be addressed promptly and the originator informed as to its impractical aspects in an academic and a political manner.

Whether the company uses project management or its hybrid form, matrix management, where the project management organization is superimposed on a variety of functional departments, delegation is enhanced by employing a few basic principles:

▪ Explain what is expected, when and in what format. Questions should be encouraged and answered in detail. Never rush through the explanation of an assignment. If the delegator signals that the task isn't of sufficient importance to explain in detail, the subordinate often develops indifference. Indifference is the prelude to ineffectiveness.

▪ Emphasize creative possibilities, not obstacles. To list obstacles only enlarges them.

▪ Inform delegates about activities peripheral to their assignments. This encourages a team effort and shows the importance of the assignment. Isolating assignments makes people bitter, not better.

▪ Seek eye contact. Often people who study their shoes or nails while a project task is being explained do not absorb details or nuances. If someone's eyes wander excessively while receiving an assignment, ask that person to repeat the essentials of your talk. Clarify

See **Delegate** page 20

Kahn is an Orlando, Fla.-based communications and management training consultant.

GUIDELINES

ERIC SCHMALL

Communications chiefs need command qualities

Communications managers should act as catalysts to induce innovations within their companies. They should encourage deliberate, purposeful changes in communications technologies, services and methodologies in order to help an organization meet its goals.

In a chemical sense, a catalyst allows reactions to occur at accelerated rates. So it is with technological communications change in an organization. A company may drift or stumble into different communications methods or products that may or may not allow the establishment to meet its goals. A communications section, however, should provide deliberate direction and prompt action toward matching corporate needs with technology.

As an agent of change, the communications manager assumes a number of specific responsibilities. Among the most important of these tasks are the recognition of the changing technical and regulatory environments, the evaluation of those changes' importance to the corporation, the advocacy of a selected course of change, the implementation of this transformed service or product and, finally, the eventual replacement of the change once its usefulness is spent.

The result of these reviews are reports and studies, tactics and strategies that advocate purposeful, reasoned change in light of the technology's accelerated change. The real stumbling block, the matter that can most seriously thwart the catalytic action the manager must provide, is contained within the last arc of the cycle — replacement of systems and services that the manager installed originally.

Life cycles of communications systems no longer encompass decades. The aggressive push of technology and fierce competition force communications professionals to reevaluate communications approaches in much less time. As a consequence, significant amounts of equipment can be changed in periods of five years or less.

Often, because of the intense involvement that a person must commit to the process of change, it becomes difficult to release technology that has become obsolete. The analyst who carefully nurtures an idea, watches it take root as an approved plan and brings it to full maturity through installation and operation processes has developed a certain kinship with

See **Change** page 20

Schmall is network systems manager for an insurance holding company.

Delegate from **page 19**

as much as is required.

- Never play up or exploit mistakes. Tactfully note misunderstandings and explain the desired approach. People more readily accept an assignment and do the job well when they feel comfortable with the delegator.
- Avoid competition among team members. Some managers delegate the same problem to different people because "competition is healthy" and "we get more alternatives to resolve the problem." Most people are stimulated by mild competition, but when employees perceive the stakes to be high, enjoyment and motivation fade. Good people simply drop out, a condition signaled by minimum output and general indifference.
- Appreciate that each employee is a member of an informal work group. Even well-motivated people can be discouraged from superior work by poor group attitudes. Thus, it is important for the delegator to know the delegatee's work environment and operating frame of reference.
- When delegating, always include a time frame. Set realistic schedules and stick to them. If the staff member agrees to the schedule, the delegator should expect job completion on time. If the person disagrees with the suggested time frame, reevaluate in light of his information. Adjust the schedule if necessary.

Once the adjusted schedule is accepted, the delegator has the right to expect timely work. Under normal circumstances, never allow an employee to overshoot the agreed schedule. Call for the work on the due date. Accepting time overruns without any form of disciplinary action signals that your schedule is subject to continuing negotiation.

- Encourage the "serendipity player," the person who finds valuable data that was not sought. Some managers get quite upset with employees who depart from assigned parameters, even when they produce useful information not directly connected with the current problem. The assignment completion is primary, but accept the peripheral information as a bonus.
- Delegate a task to an individual, not a committee. There is no feasible way that the delegator can hold a group accountable without a disastrous communication breakdown. The person who receives the assignment may form a committee, but he must recognize his personal accountability.

Managers are industry's orchestra leaders. They cannot present renditions alone. Delegation of score segments to motivated and trained players assures the best possible presentation and execution of difficult work. How well delegation is done determines whose programs and whose organizations flourish.

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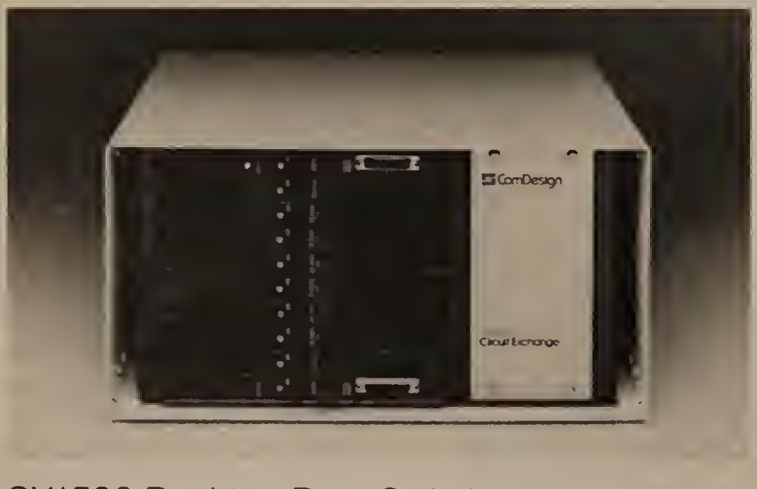

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Parliament from **page 19**

members, senators and administrative support staff. It also provides electronic mail services to 303 interlinked constituency offices throughout Canada via an X.25 gateway link.

Although the government staff relies on the network for data transmission services, the primary function of Oasis is to provide live coverage of Parliament sessions and frequent news updates to network users. Telecommunications services are handled separately by Canada's Department of Communications.

According to Jim Phillips, director of Oasis, broadband was chosen over a fiber-optic scheme because it was less expensive and easier to install in a multidrop environment. "When we began planning the network [in 1981]," he recalled, "coaxial cable was fairly stable, and products were available off-the-shelf."

Phillips said the job of cable installation in Parliament's turn-of-the-century limestone and sandstone buildings was trickier than it might have been in newer facilities. Project stipulations called for complete preservation of the Parliament's Gothic facade.

"Rewiring the old buildings required a lot of site surveying," Phillips said. "In many cases, there were no floor plans, walls typically didn't line up and spaces between stone walls were filled with rubble."

Phillips said the goal of Oasis is to provide a full range of commercial video services from cable companies on one set of the dual cable. The other set of cable is reserved for institutional programming specific to the Parliament community. The project would replace Parliament's old method of producing materials for broadcast, transmitting the information to cable companies via satellite for live coverage or future playback.

Almost all programs are offered separately in both French and English. Institutional services include a Teleindex, which lists all commercial and institutional programming, live coverage of press announcements and a channel that passes information to various political caucuses.

"In the past, some of this information was produced on paper," Phillips said. "But the environment is very susceptible to changes and cancellations of meetings. Now we don't have to generate more paper and send it out to all members of Parliament. Information can be updated on Oasis."

On the commercial network, Parliament members can view informational programming, such as CBS's "60 Minutes," or watch compiled network news segments. The news segments are summarized so members can observe how each station covers particular issues. "Senators can see all broadcasts pertaining to grain subsidies, for example," Phillips said.

Although end users pay for their own televisions, personal computers and terminals, Phillip and his staff have laid down strict equipment requirements. All data communications networking tools must be both Microsoft Corp. MS-DOS- and RS-232-compatible. "We must have strict standards," he said, "because there are too many users and too few people to support them." There are two technicians who oversee the cable plant and approximately eight people dedicated to the Oasis hot line and training. Phillips is responsible for all Oasis training and installation of any new network equipment.

Phillips added that planning a government communications system is similar to planning a corporate system because both projects have the same financial, personnel, political and technological risks.

His biggest management concern is easing the new video services into the Parliament culture in a nondisruptive manner. "There are 282 members; therefore, we are addressing ourselves to 282 different businesses or one company with 282 affiliates," Phillips said.

Change from **page 19**

that particular system.

Many managers today owe their success in this field to the systems they implemented not so long ago. The ownership involved here goes way beyond holding title to some hardware.

Intense competition and sweeping technical change will provide cogent arguments for abandoning installed, established methods and systems often long before their predicted lifetime has expired. The communications manager can find himself caught in the pincers of these unfortunate conditions. On the one hand, he is identified as the prime mover and owner of the current equipment; on the other hand, he is obliged to move the organization toward change to improved systems under the right circumstances.

No one likes to face the fact that the forecasted usefulness of a service has been proven inaccurate by sudden shifts in the marketplace. Under such unpleasant conditions, it is tempting for an individual to argue not for change but for maintaining the status quo.

Many strong arguments can be established for not rushing into change. One must consider the costs, organizational capacity for change and the maturity of the new offering as well as the results of those users who like to act as pioneers in this field.

The manager needs the ability, however, to perform some honest soul-searching whenever he takes a position that recommends against change. Does this stance rest upon logical, business reasons or is the individual's ego and reputation too bound up with the status quo?

The manager who transcends the anxieties related to personal ownership in current systems and who can honestly approach the subject of change recommendation and management is the one who will best serve the organization in these chaotic times.

NEW PRODUCTS AND SERVICES

See inside for:
▶Portable T-1 circuit analyzer
▶Micro-to-mainframe link

▶COMMUNICATIONS SOFTWARE

Wang hitched to Soft-Switch

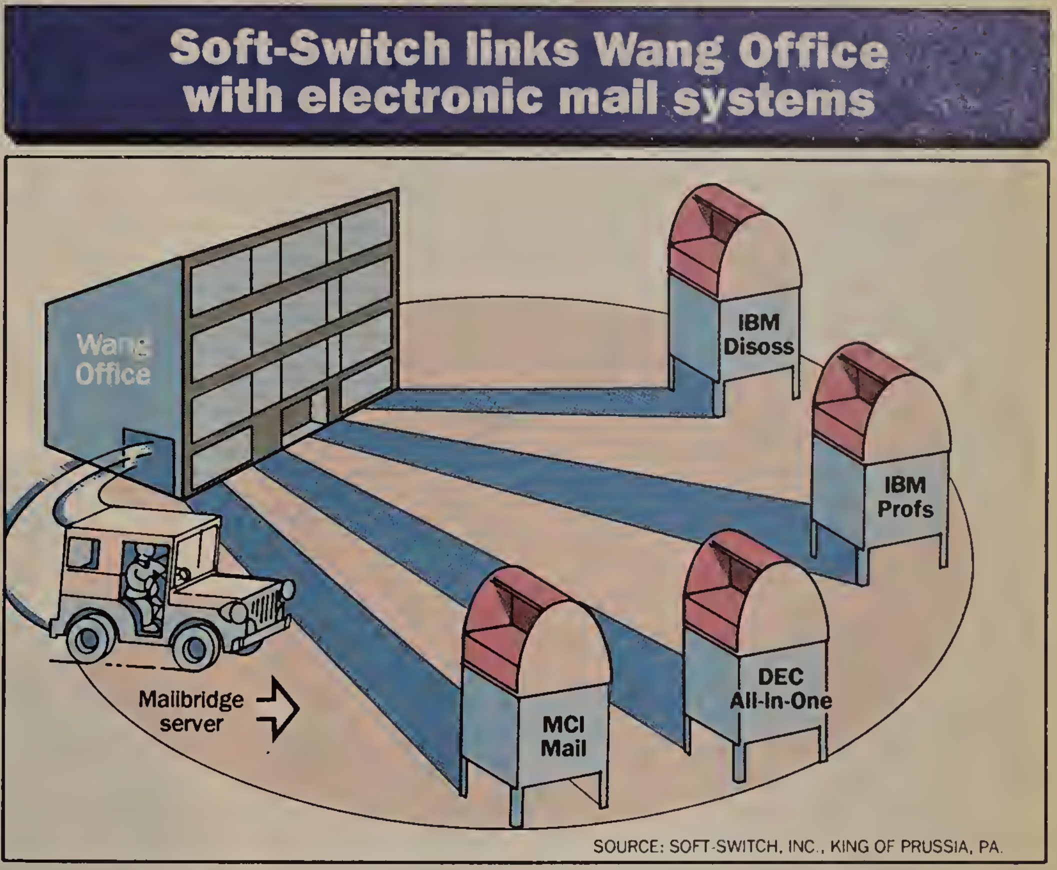
Document translation tool enhanced.

KING OF PRUSSIA, Pa. — Soft-Switch, Inc. has enhanced its document translation software so that it works with Wang Laboratories, Inc.'s Wang Office software.

Soft-Switch provides a series of products enabling a company to set up an electronic mail system that operates in peer-to-peer fashion and links a variety of vendors' products. The company offers four products that do much of the document translation work. Mailbridge Server/Profs, Mailbridge Server/DEC and Mailbridge Server/MCI are three of these packages.

The fourth package was Mailbridge Server/Mailway, which supported only Wang's Mailway E-Mail system. That package has been enhanced so it can also work with Wang Office applications and has been renamed Mailbridge Server/

See **Translation** page 24


Soft-Switch links Wang Office with electronic mail systems

SOURCE: SOFT-SWITCH, INC., KING OF PRUSSIA, PA.

▶DATA TRANSMISSION

Fiber modems leverage 3299s

FiberCom tools extend IBM's eight-channel multiplexer.

BY JIM BROWN
New Products Editor

ROANOKE, Va. — FiberCom, Inc. unveiled two modems that take advantage of IBM's recently announced 3299 multiplexer. The multiplexer can be used with various types of wiring and can attach terminals to an IBM controller.

The Whisperlink/SNA modem converts the 3299's multiplexed electrical signal into an optical signal. The signal can then be transmitted to another Whisperlink/SNA modem over a single 50-micron core fiber-optic cable at distances as great as 15,000 feet.

The modem can be linked to a 3299, which has eight multiplexed channels. Another use for the FiberCom product is linking a remote terminal to a 3274 terminal controller.

Whisperlink/SNA works in full-duplex mode and operates at speeds between 300 bit/sec and 19.2K bit/sec for either synchronous or asynchronous transmission. Whisperlink/SNA comes with an IBM RG-59-type connector, found on the 3274 controller, IBM 3270 series Type A terminals and other equipment supporting IBM's Systems Network Architecture.

FiberCom also offers a Whisperlink/SNA version called the TFM-327X that meets the Transient Electromagnetic Pulse Emanations Standard, a government standard designed to reduce the radiation emanating from traditional coaxial cable. This standard is used for applications that require a great deal of security.

The Whisperlink/SNA model is priced at $350, and the TFM-327X model lists for $695.

▶VOICE MESSAGING

Zymacom upgrades server

Record, store, playback features supported.

WESTFORD, Mass. — Zymacom, Inc. added voice messaging capabilities to its Information Exchange, a system that can supply a private branch exchange with local-area network capabilities.

A Voice Messaging Server option was added in Release 2.3 of the Information Exchange, the system that was introduced last March. At the heart of the Information Exchange is the Central Server, which links personal computers, telephones and terminals over telephone wiring.

The system operates in a stand-alone environment or can be integrated with an on-site PBX. In addition to the optional voice messaging, the Central Server supports file transfers between personal computers, text messaging and voice synthesized text messages for up to 220 users.

The Voice Messaging Server is linked to the Central Server over an RS-232 connection. The hard disk-based Voice Messaging Server supports up to eight hours of digitized voice storage on up to four 20M-byte hard disks. Voice messages are digitized at the rate of 32K bit/sec, according to the firm.

> *"At the heart of the Information Exchange is the Central Server."*

Software residing in the Intel Corp. 80286 microprocessor-based Central Server controls voice-messaging features that include electronic mailboxes, personalized greetings and digitized voice message storage. The Central Server instructs the Voice Messaging Server to record, store and play back voice messages.

The Central Server can be configured to give callers the choice of entering the voice-messaging system to leave a voice message or stay on the line to leave a message with a live operator.

Once a voice message has been stored, a message-waiting light is illuminated on the recipient's telephone. The recipient accesses the Voice Messaging Server from a push-button telephone. Recipients can have their messages played back and then respond to a message if the sender has a voice mailbox.

Zymacom has sold 12 Information Exchange systems since March. President John Connolly said the firm is developing a networking scheme that would tie remote Central Servers together and supply in-house messaging and personal computer file transfers across a corporation.

The firm is also developing an autodialing function that will be added to the communication device that links telephones to the Central Server.

Purchased as an option, the Voice Messaging Server will cost between $20,000 and $30,000. A 116-user Information Exchange system comprising a Central Server supporting personal computer file transfers, text messaging and speech synthesis along with a central message center operator console, three printers and two shared modem ports would cost about $50,000.

SOMETHING BRILLIANT JUST HAPPENED TO DATA TRANSMISSION.

Introducing Public Data Network* from the Bell Atlantic Network Services Group. A startling communications development that's just made other interactive data transmission modes seem all but obsolete.

Packet Switching goes public.

Public Data Network offers the benefits of packet switching—through the telephone network—at speeds up to 9600 bps. By batching data into electronic "packets," Public Data Network is ideal for "bursty" applications like order entry, billing, information processing, credit approval, reservations, ticket sales and claims.

Suddenly, there's a more efficient way to move data.

Our Public Data Network is, without a doubt, the most efficient way to move interactive data. Period. What's more, rates are usage-based—dramatically lower than dedicated line costs.

Introducing automatic protocol conversion.

And because Public Data Network supports X.25 and asynchronous protocols, it's the perfect link between dissimilar data processing equipment. Like office and home computer terminals and multiple data bases. It also opens the door for electronic banking and electronic shopping and a long list of other interactive electronic subscription services.

A host of advanced network solutions.

In addition to Public Data Network, the Bell Atlantic Network Services Group provides an array of customized services to precisely match your communications needs.

From voice circuits to a variety of digital data services including High Capacity Digital Service and fiber-optic-based High Capacity Lightwave Service, we offer full duplex dedicated and switched digital data transmission at speeds ranging from 300 bps to 560 megabits. On a point-to-point or multi-point basis.

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Without optimized network transmission capabilities, your communications system is handicapped. That's where we come in. By applying our most valuable asset—our network expertise—we can unlock your system's potential, adding value through increased operating efficiency.

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Translation from **page 21**

Wang Office.

The server works with a Wang Application Program Interface, which enabled Soft-Switch to develop an interface that ties another user into Wang Office transparently. With Mailbridge Server/Wang Office, a user can view documents from other E-mail systems as if they were created with Wang Office. The server was developed under a cooperative program with Wang.

Through Mailbridge Server/Wang Office, a user can exchange memos, phone messages and invitations with users who work with other Soft-Switch packages. For example, a memo can be distributed to IBM Professional Office System (Profs) or Digital Equipment Corp. All-in-One users as well as Wang Office users.

When used with Mailbridge Server/MCI, a user can distribute telexes, letters and courier packets by a single command.

In addition to the four E-mail servers, Soft-Switch offers other packages that enable a user to work with various types of documents. WP Mail supplies IBM Document Interchange Architecture capabilities. PC/TSO Mail enables an IBM Personal Computer user to work with an IBM 3270 application. Snads Gateway runs on IBM's System/36, System/38 and 5520, all of which use Systems Network Architecture Distribution Services to distribute documents.

> *“When used with Mailbridge Server/MCI, a user can distribute telexes, letters and courier packets by a single command.”*

Soft-Switch's broad range of products enables a user to work with a variety of E-mail and office automation applications. With the Soft-Switch line, a user is able to work with packages such as IBM's Profs, DEC's All-in-One, MCI Communications Corp.'s MCI Mail and Ashton-Tate's Multimate.

The company claimed that more than 100 companies, primarily Fortune 500 companies, are now working with at least one Soft-Switch product.

The software costs $18,000 for a license that can be used on up to six VS systems.

Other VS nodes can be added for $3,000 each.

Products & Services

Local net server, software links Ethernet to SNA

Eastman Communications, an Eastman Kodak Co. division, announced a network server and software that links Ethernet local-area network-connected devices to an IBM Systems Network Architecture mainframe for file transfer and terminal emulation.

The **Syncra LAN Server** mimics an IBM 3274 cluster controller when used with Vtam-supported communications software. The device supports up to 64 concurrent terminal sessions and attaches to the mainframe over leased or dial-up lines at 19.2K bit/sec or 64K bit/sec. A direct connection operating at 1.8M bit/sec is supported if the device is located within 200 feet of the mainframe.

The **Syncra Software LAN Terminal Emulation** package resides on Unix-based workstations including Sun Microsystems, Inc., Apollo Computer, Inc., AT&T's 3B series, IBM Personal Computers and compatibles and Digital Equipment Corp. VAX minicomputers and MicroVAX systems running under VMS.

The package's IBM 3270 terminal emulation reportedly supports personal computer file transfers and multiple host sessions. The package also supports IBM 3770 remote job entry emulation.

The **Syncra Software LAN Data Transfer** package operates in DEC VAX/VMS environments. The package reportedly off-loads VAX resident files to the SNA mainframe and supports extended error recovery, automatic checkpoint restart and data compression, compaction and encoding.

The package communicates through the Syncra LAN Server to an SNA mainframe equipped with Syncra Data Communications Software.

Pricing for the Syncra LAN Server, jointly developed with Mitek Systems Corp. of Carrollton, Texas, and operating software begins at $34,000. A single-user Unix version of the Syncra Software LAN Terminal Emulation package is $750, and a multiuser Unix version costs $2,000.

A single-user VAX version of the Syncra Software LAN Terminal Emulation package is $1,000 and $4,000 for a multiuser version. The Syncra Software LAN Data Transfer package is $7,000.

Eastman Communications, 1099 Jay St., Rochester, N.Y. 14650 (716) 464-5500.

Portable T-1 circuit analyzer

Telecommunications Techniques Corp. introduced a portable T-carrier analyzer.

The **T-Berd 209** is designed to test T-1 and T-1C circuits in the field or the central office. It is used to test recently installed T-1 circuits and for tracking error conditions.

The device can be used for monitoring on-line circuits and testing circuits when out of service. Two error measurements can be displayed simultaneously. Test results may be output to either a printer or to a data base.

The unit costs less than $5,000, a spokesman said.

Telecommunications Techniques Corp., P.O. Box 6027, 444 N. Frederick Ave., Gaithersburg, Md. 20877 (800) 638-2049.

Micro-to-mainframe link

Eastern Information Services, Inc. announced a microcomputer-to-mainframe link that incorporates some features found on IBM's Disoss.

To exchange data, the company's Indaax/WP uses IBM 3270-series terminal emulation and software on both the personal computer and mainframe.

The product resembles Disoss because a user can store documents on a mainframe.

Users work with an indexed directory that references attribute information including class, name, subject, location of document, name of author, client reference, document identification, one to six keywords and date of creation or date of revision.

Indaax/WP also supports IBM's Document Content Interchange.

Pricing for the software ranges from $12,500 for 25 users to $55,000 for a site license.

Eastern Information Services, 2500 Office Center, Willow Grove, Pa. 19090 (215) 657-0647.

Portable protocol analyzer

Hewlett-Packard Co. announced a portable, microfloppy disk-based protocol analyzer for testing and configuring data communications networks.

The **HP4951C** protocol analyzer, which operates at up to 19.2K bit/sec, monitors and decodes data transmission, simulates network components and performs bit-error tests at remote sites.

The device can also transfer data, programs and test setups remotely with HP protocol analyzers at host sites.

The unit's software includes an asynchronous terminal emulator and an IBM 3270 installation and maintenance module that supports Binary Synchronous Communications and Systems Network Architecture test functions.

The device includes a microfloppy disk drive that stores data gathered from a line test for later evaluation.

The HP 4951C with microfloppy disc drive and an RS-232-C/V.24 interface lists for $4,000.

Hewlett-Packard Co., 8020 Foothills, Roseville, Calif. 95678.

Unit measures T-1/T-1C errors

The **Sierra Electronic Division** of **Lear Siegler, Inc.** introduced a test set for maintaining and troubleshooting T-1- and T-1C-based pulse code modulation systems in an office environment.

The **Sierra 4005 T1/T1C Error Performance Analyzer** runs either end-to-end or loop-back tests to measure bipolar violations, logic errors of omission and commission and B8ZS (clear coding) violations. The unit features an in-service monitoring capability, menu-driven test setup routines and an RS-232-C electrical interface for remote operation.

The Sierra 4005 T1/T1C Error Performance Analyzer costs $3,500.

The Sierra Electronic Division of Lear Siegler, Inc., 3885 Bohannon Drive, Menlo Park, Calif. 94025 (415) 321-5374.

Tangram, Lotus develop communications software

Tangram Systems Corp. and **Lotus Development Corp.** are jointly developing communications software that will support downloading of Lotus' 1-2-3, Symphony and other packages from an IBM mainframe operating under MVS or VM to a personal computer.

The communications link will be a customized version of Tangram's **Arbiter** and Lotus' **Electronic Distribution System (EDS)** micro-to-mainframe link package. The development is part of Lotus' Multivalue Plan (MVP) that was announced last August (“Lotus busts user software shackles,” *Network World*, Aug. 18).

As part of that 10-point plan, Lotus will provide users with a single mainframe copy of a software product and charge users for the number of times that the package is downloaded to microcomputers. MVP will also allow for easier distribution of software upgrades, which will be downloaded in the same manner.

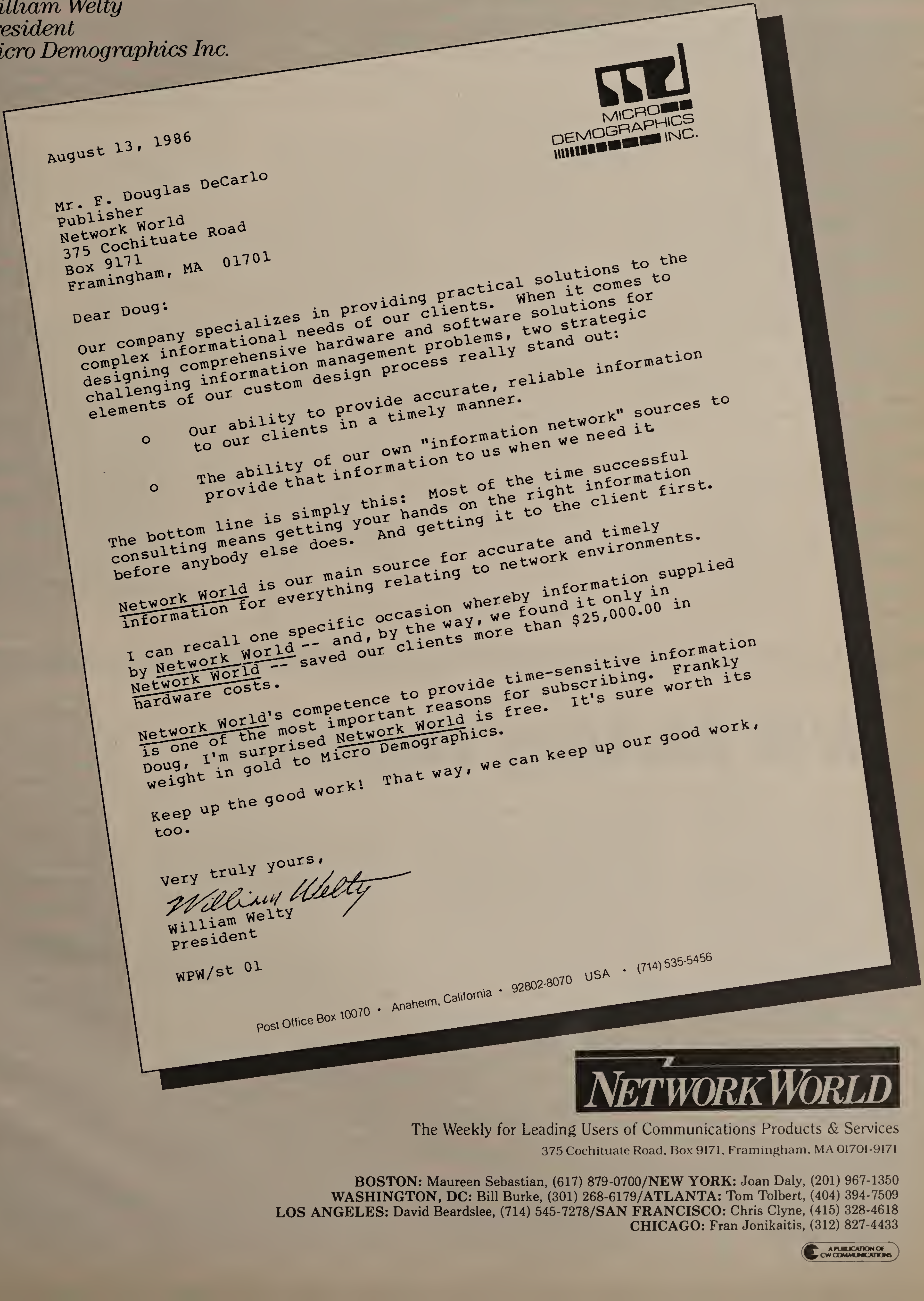
According to a spokesman for Tangram, Tangram and Lotus engineers are revamping the Arbiter and EDS software to include, among other routines, an accounting system to keep track of the number of times a Lotus product is downloaded, as well as adding password security to the communications link.

A central copy of the customized Arbiter/EDS will reside on the mainframe, while each personal computer will require a complementary package to establish a connection with the mainframe version, according to Tangram.

The MVS version of the product is expected to enter the beta test stage later this year, with the VM version to be completed early next year. Lotus is also developing a networking package to distribute spreadsheet functions across a net.

“...information supplied by *Network World*—and, by the way we found it only in *Network World*—saved our clients more than $25,000 in hardware costs.”

William Welty
President
Micro Demographics Inc.



MICRO
DEMOGRAPHICS
INC.

August 13, 1986

Mr. F. Douglas DeCarlo
Publisher
Network World
375 Cochituate Road
Box 9171
Framingham, MA 01701

Dear Doug:

Our company specializes in providing practical solutions to the complex informational needs of our clients. When it comes to designing comprehensive hardware and software solutions for challenging information management problems, two strategic elements of our custom design process really stand out:

- Our ability to provide accurate, reliable information to our clients in a timely manner.
- The ability of our own "information network" sources to provide that information to us when we need it.

The bottom line is simply this: Most of the time successful consulting means getting your hands on the right information before anybody else does. And getting it to the client first.

Network World is our main source for accurate and timely information for everything relating to network environments.

I can recall one specific occasion whereby information supplied by Network World -- and, by the way, we found it only in Network World -- saved our clients more than $25,000.00 in hardware costs.

Network World's competence to provide time-sensitive information is one of the most important reasons for subscribing. Frankly Doug, I'm surprised Network World is free. It's sure worth its weight in gold to Micro Demographics.

Keep up the good work! That way, we can keep up our good work, too.

Very truly yours,

William Welty

William Welty
President

WPW/st 01

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NETWORK WORLD

The Weekly for Leading Users of Communications Products & Services

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A PUBLICATION OF CW COMMUNICATIONS

Opinions

ELECTRONIC MAIL

WALTER ULRICH

Users group promotes E-mail

These days, $250 doesn't go very far. This sum is insignificant compared with a typical communications budget. However, $250 can buy a lot for the savvy network manager.

For $250, a manager can pay for an initial membership in the Electronic Mail Association (EMA). Vendors pay several thousand dollars to join because they have a financial stake in promoting the industry, but end users pay only $250 for the first 12 months and $500 per year thereafter.

The EMA is an association concerned with a vital technology that is just begging for user input. The organization has a great track record, and the benefits for communications managers who join it are substantial.

Electronic mail is a technology on the upswing. The Office of Technology Assessment has predicted there will be 18 billion electronic messages in 1990 and 60 billion in the year 2000.

Workstations are proliferating, user access is more friendly, and interconnection is just around the corner. The impact of E-mail on corporate networks will be significant, and its success in the marketplace is just beginning.

The EMA is also having its share of success. Right now, the Electronic Communications Privacy Act is awaiting President Reagan's signature. This bill has the potential to protect the privacy of all forms of data communications and electronic mail.

Until this bill is passed, there are portions of communications networks that are fair game for hackers. Wiretappers can eavesdrop with legal impunity.

If the Electronic Communications Privacy Act is signed into law, hackers and wiretappers will be subject to criminal penalties and civil liabilities. The association was instrumental in advising the U.S. Congress about this issue, developing consensus among various constituencies and encouraging final passage.

The EMA has always been user-oriented. The association recently published a brochure on E-mail security issues. This guide is available to all users, members and nonmembers alike, from the EMA national office.

The association also publishes a membership guide that reads like a Who's Who of the communications industry. Founding board members include AT&T, Graphnet, GTE Telenet Communications Corp., IBM and Western Union Corp.

Although EMA's membership is mostly vendors, the association is striving to attract users and other interested parties by offering lower dues and by addressing more user-oriented issues. End users are represented by Citicorp's Rich Coughenour, who was chairman of the association for two consecutive terms.

Current members include major hardware vendors, communications companies, consultants and researchers from North America and Europe.

The EMA is taking an active role in the area of standardization. Two years ago, the EMA and the U.S. Department of Commerce jointly sponsored what is now known as The Boulder Conference. This conference set the stage for the implementation of the X.400 standard.

The EMA was founded to promote the use of electronic mail and to provide a forum where vendors, users and others could share ideas.

User involvement has an impact on product design. The advantage for companies in joining the EMA now is that they can have a part in shaping products and standards, rather than having to learn to live with them later.

Educational sessions in which authorities talk about the technological, product and market trends of electronic mail are an important part of the quarterly EMA membership meetings. Membership meetings typically cost $35, including lunch.

Legislation affects fair competition, privacy and taxation on computers, communications and electronic mail. Regulation is constantly changing. The EMA is an effective voice in Washington, D.C. protecting the interests of the business community, and the EMA can give managers an effective voice in Congress.

The association is also active in international issues. Artificial barriers that block the free flow of information across national boundaries must be dismantled.

See **Policy** page 30

Ulrich, a partner in Coopers & Lybrand, manages the firm's Walter Ulrich Consulting subsidiary in Houston. He is also one of the eight founding board members of the EMA and chairman of the association's privacy committee.

TRENDS

BRIAN JEFFERY

Will history repeat?

Allentown, Pa., is not a happy town. Unemployment is high, and the old coal and steel industries are slowly dying.

In Allentown, they'll tell you of the heyday — of a boomtown caught in America's first industrial revolution. That was a long time ago. Now the world has moved on, and Allentown hasn't changed. It faces the decline of its industries with bewilderment and bitterness.

Very sad, you say, but times have changed. Today, it is the information-processing industry that is in ascent nationwide. Vendors work from clean, air-conditioned, plexiglass offices, the engineers and technicians are second to none, and the industry has hardly scratched the surface of the potential demand for high-tech products and services.

But perhaps the fate of Allentown isn't so far away for these vendors. Industry recessions and slowdowns of recent years may have been merely a hiccup or, more likely, they indicate a slower, more basic change in the information processing sector that could leave many vendors as high and dry as Pennsylvania's steel mills. To understand that change, a little industry history is necessary.

The story begins in the late 1950s in a New England mill, where Ken Olsen invents the minicomputer. Later, New England's high-tech highway, Route 128, explodes, scientific instrument maker Hewlett-Packard Co. contributes from the West Coast and a wave of new, more compact computers sweep the world. A brief subplot emerges as Dr. An Wang discovers word processing, and a new set of vendors appear.

Meanwhile, on the mainframe computer front, IBM has been doing battle through the 1960s and 70s with giants like Xerox Corp. and RCA Corp., upstarts like Frank Norris' Control Data Corp. and a string of lumbering machinery firms like Burroughs Corp., Honeywell, Inc., NCR Corp. and Univac. With the 370 Series, IBM blasted its way to a position of dominance, where it has remained ever since.

Enter the personal computer, and new companies materialize and grow at a rate that makes even the growth of Digital Equipment Corp. and HP look pedestrian. In the background, a chorus of Crays, computer-aided design and manufacturing vendors, process control specialists, Unix workstation suppliers and others emerge.

What's interesting about all this is that nobody ever seems to catch the next wave. IBM did manage a belated entry into the mini marketplace, but it never amounted to much.

IBM also, of course, hit it big in the personal computer market, but this was so out of character for Big Blue that the company later experienced deep remorse, dismantled its personal computer division and set about covering its personal computer base with software that would hopefully cause them all to turn into 3270 terminals.

Otherwise, most of the mainframe vendors missed minis, most of the mainframe and minicomputer vendors missed the personal computer boat and the personal computer vendors ultimately ground to a halt because they couldn't think of what to do next.

On the telecommunications side, the 1968 Carterphone Decision begat interconnect private branch exchange vendors, a slew of bypass suppliers reached the market and local-area network vendors with offbeat names sprang up in Silicon Valley. Meanwhile, AT&T proved painfully slow in reacting to its opportunities.

The bottom line is that each new technology's wave of products brought with it a new set of vendors. Markets were well-defined, and the users' territories and budgets were separate. Mainframe vendors sold to MIS managers, and telecommunications firms sold to telecommunications managers.

Jeffery is research director at the International Technology Group in Palo Alto, Calif.

Opinions

▶ TELETOONS — By Phil Frank

I'm telling you, Ralph.. these new people from robotics just don't fit into our social network...
Phil Frank

Minicomputers and later local-area networks were bought at the departmental level. Word processing groups bought word processing equipment, and both individuals and departments bought personal computers.

Then slowly the game began to change. Deregulation in telecommunications accompanied a breakneck pace of electronics technology that began to make it possible for computers to communicate. The network emerged as a key concept in the information processing sector, and end users began to move toward integration.

General Motors Corp. triggered a revolt that brought more users into the picture to demand standards that worked. And while few users were sure what it was all about, concepts like integrated services digital network loomed up out of a murk of jargon to suggest that the whole move toward integration was going to go haywire before too much longer.

The trouble was that the industry structure was one of specialist suppliers who refused to recognize that the world was changing. Their reaction was mostly one of half-hearted diversification followed by decisions that these new markets were not their business and that the world actually needed more mainframes or minis or personal computers, PBXs or whatever was their specialty.

This was at best a temporary solution. What was lacking was the software skills, organizational techniques and cultural orientations that could let the suppliers deal with user requirements as a whole. That which could easily be automated had already been automated. The key challenge was to make the whole more than the sum of the parts. Unfortunately, the industry was structured in such a way as to be unable to respond to this challenge. An impasse was reached.

Then a few large, high-priced systems integrators, such as Boeing Computer Services Co., Martin Marietta Data Systems, Inc. and Electronic Data Systems Corp., came lumbering out of the government sector, fleeing spending slowdowns and seeking new markets among the biggest corporations. IBM responded but was limited by its

See **Trends** page 37

NET MANAGEMENT

JAMES CARLINI

Don't skimp on management

The time has come to take a good, hard look at spending a little more money on the proposed network that your organization has on the drawing board. It's time to consider a network management system. The trouble is that many organizations do not see these systems as an integral part of the network in the planning stage; yet in the operations stage, they wonder how to control net management.

There are four basic laws of data communications. Networks never get smaller; they never get slower; they never stay the same; and they never work all of the time.

Keeping this in mind, today's corporate information manager must focus on the trade-offs between the added costs of a network management system and its benefits when designing any network of substantial size. The cost of adding network management up front is often paid back many times over in the course of day-to-day operations. But while it seems logical to add this type of insurance onto a network at the planning stage, many companies still think it's an extra they can do without.

Organizations that think they are saving money by disregarding network management are setting themselves up for major problems. Decision makers at the executive level are just getting used to the idea that networks can act as information highways for their organizations. If they would take the time to investigate other approaches that have been used over the years, they would find that establishing a network management system to control and monitor their network is critical to maintaining the reliability and integrity of the information transmitted.

The operational steps to network management are problem recognition, isolation and diagnosis; facility repair; acceptance testing; and restoring service to the user. If an organization does not have a network management system in place, chances are that these operational steps are not being performed or are being performed erratically.

In the absence of network management capabilities, problem recognition is a slow process. Monitoring equipment can pick up on problems before the user calls the network manager. Also, the process of isolating and diagnosing problems takes more time when done manually than if those functions are automated. Once the facility is repaired, users without network management systems usually take the vendor's word for it. With an automated system, repairs are easy to check because the same battery of tests can easily be run again.

In evaluating a network management system, look for improved service levels to end users, increased resource (modem, multiplexer, computer) utilization, greater staff productivity, better vendor management and improved network planning.

Accurate data on system failures provides insights on how they affect business. Obtaining such information would otherwise require the services of a consultant. Network management systems not only deliver this consultative insight but also improve cost controls by allowing users to track systems operation more closely. The result is better managed resources.

Greater staff productivity is achieved by centralizing control over multiple data centers. A natural evolution to an "operatorless" environment is under way as many diagnostic processes become automated. As a result, operators require a lower level of technical expertise, and a higher consistency of performance is attained. The days of service valleys created by senior network technicians leaving for a better opportunity are virtually eliminated.

The excellent audit trails provided by a network management system allow users to manage vendors instead of the other way around. Measuring vendors' service response and equipment performance becomes a built-in management tool, and finger pointing between vendors is lessened.

Improved network planning becomes an embedded management function instead of an item on tomorrow's agenda. The information manager can monitor

See **Management** page 30

Carlini is president of Carlini & Associates, a management consulting firm in Westmont, Ill. He also lectures on information technology at Northwestern University in Evanston, Ill.

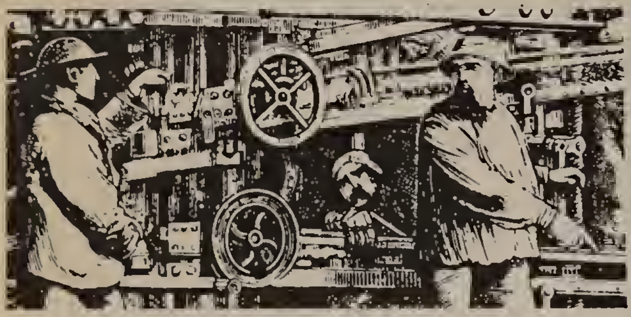
NETWORK WORLD

Features

October 27, 1986

Domesticating the switch-and-wire beast
AT&T adds intelligence to a monster of a network and turns it into an amiable animal. By giving customers more control and lower costs, AT&T is hoping users will turn to telecommunications to solve their business needs. The good news is that there are lots of choices; the bad news is that users have to make the choices.
Page one.

The management looking glass
You can't win top management's support by expounding on the wonders of technology, but you can move your company and yourself ahead with the right strategic ideas. The first step is to broaden your knowledge and gain respect at all levels of the company. The next step is to apply the technology to corporate issues and sell your solutions to management.
Page 28.



Hitting pay dirt for the do-it-yourself manager
There are thousands of technical publications available today, yet communications managers can't spare the time to thumb through them all to find current information that's applicable to their specific networking needs. Luckily, AT&T and Bellcore have simplified things by assembling catalogs of their technical documents.
Page 31.

Do you have some special knowledge that could benefit other communications users? *Network World* is seeking feature articles on the following topics: smart cards, communications financing options and Centrex.

Send proposals for user-oriented articles on these and other timely communications topics to Steve Moore, features editor, *Network World*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701, or call (617) 879-0700 ext. 584.

MANAGEMENT STRATEGIES

The managem looking g

BY PIERRE DUMAINE
Special to Network World

The first step to successful telecommunications management is to establish a reputation and be noticed at all levels of the organization. Managers' approach should be like Alice's in Lewis Carroll's *Alice in Wonderland:* Alice looks into the looking glass where everyone has looked before and sees something that no one has ever seen.

The best management looking glass, however, is not an inward-looking mirror but a far-ranging telescope that zeros in on key emerging trends. For communications managers, the question is how best to take advantage of communications technology's increasing importance to advance both their needs and those of their company.

Dumaine is consulting analyst for corporate telecommunications services of NCR Corp. in Dayton, Ohio.

The rapid pace of change in communications is a challenge for managers to do something better. They must be equal to that challenge because the time between now and the turn of the century holds the greatest promise for success in the area of telecommunications. An opportunity exists to change the way in which corporations and the world communicate.

Acting from a broader perspective puts communications managers ahead.

In a business as complex and dynamic as telecommunications, it is

ent ass

not difficult for managers to become so concerned with the technical issues surrounding their work that they lose sight of the bigger picture. Overall, telecommunications managers' self-worth and the value it brings to them and their organization are generated through a cycle of personal and professional rewards.

Communications managers often become specialized in their technical vocation to the exclusion of almost all other personal or business career goals. This can result in managers being typecast and limited at work even though they have as much to contribute as company attorneys, accountants and executives.

The issue is one of perception. How do communications managers view themselves, and how are they perceived by others? They must ensure that their image is positive. One method of doing this is to capitalize on a change already taking place.

More and more businesses are beginning to realize that telecommunications is not just an unavoidable expense but a strategic corporate resource that is vital for survival. Managers' perceptions must also change; they must expand their perspective and knowledge in order to live up to rising expectations.

The best place to start is with the communications managers themselves. They should find a company that shares their spirit, needs and vision and then communicate their ideas to management in a way that creates excitement. Communications managers should also educate themselves, not just with the usual telecommunications training programs and seminars but with programs that will broaden their horizons, like an overseas seminar or conference.

Many managers arrived at their present position by working their way up from the bottom. They learned by doing. They built the networks, pioneered the services and got the job done. These managers should consider working toward a degree in telecommunications. Managers who already have a bachelor's degree should begin a course of study in another area or seek a master's degree. Industry analysts predict that the telecommunications manager of tomorrow will have a bachelor's in computer science and a master's in business administration.

Learning a foreign language can be important for managers who work for transnational corporations. Even if they don't gain fluency, they will be able to greet foreign visitors with polite phrases in their own language and will get by when traveling overseas. A course in foreign customs and cultures or world geography can also help. Knowledge gained in this manner is indicative of an erudite and cultured executive.

NCR Corp., for example, has

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over 1,200 offices and plants in 120 countries. While it would be impossible to learn everything about all countries, cultures and languages, certainly managers should have some knowledge about other parts of the world. This may entail simply reading internationally oriented publications such as *Economist*, *National Geographic* or the *International Herald-Tribune* newspaper.

Managers should also revamp their technical libraries and be selective in their reading. They should use respected reference manuals and books to help them form opinions on emerging technologies. A good exercise is to try to forecast trends and new developments.

Reading *The Wall Street Journal*, *Business Week*, *Time* or *Newsweek* is a must for keeping current on business, national and international issues. It's also important to read the local newspaper.

Managers should become as comfortable with these publications as they've become with communications journals. Better yet, they might try publishing an article in an industry publication or giving a lecture at a local school.

Finally, managers should read their company's annual report. This is the showcase for the company's accomplishments, and many reports contain insights from the executive office on where the company is or should be heading.

This information should be interpreted from a business communications point of view and then examined in terms of how managers can help their company achieve its goals.

Managers who faithfully follow these measures will see several pleasant changes occur. First, their self-esteem and self-confidence will increase in direct proportion to their newly acquired knowledge and experience. Secondly, their credibility will be enhanced, and others will seek their opinions and advice. Lastly, their value to the company will increase.

The management looking glass

Before managers can peer into their corporate looking glass for new ideas, they must determine their objectives. Exactly what is the communications manager's job? Saving the company money on its telephone bill? Finding an unused modem under the raised flooring in the computer room?

Beyond providing technical expertise and direction, a manager's job is to give the company a strategic advantage through applied technology. Telecommunications applied to satisfy a business need is what makes the technology strategically important to the corporation; it is what raises management's perception of telecommunications from an expense to an investment. Reinforcing that perception isn't difficult. It merely involves building a bridge between the company's goals and the means to achieve those goals.

The communications manager's job, simply stated, is to find a business need and fill it.

Managers should start by learning the company's business. They should talk with company planners, managers and supervisors or ask the international marketing group what it's like doing business overseas. They should listen and learn.

The next step is to look at the business from a telecommunications perspective. Managers should begin to develop a long-range, strategic telecommunications plan in relation to and in support of the business goals and objectives that have been identified. This is where the payoff lies for managers and their company.

Management deals with concepts and ideas. Routine details and day-to-day operations are left to others. Keeping this in mind, communications managers should organize their thoughts into a single idea and limit their presentation to 15 minutes. Too many managers prepare a tome with too many facts and figures. A clear, concise and thorough presentation that addresses the benefits to the corporation is more important. Once management approves the idea, the details can be presented.

Another good strategy in developing an idea is to get users involved from the bottom up. This is especially important for projects that cross organizational lines.

The communications manager must relate telecommunications technology to business needs and problems. A business shouldn't run in spite of its telecommunications system. This means troubleshooting and identifying existing problems. For instance, E-mail or telex can help eliminate problems of time differences and delays between offices in Madrid, Spain, and Los Angeles.

Here are some goals that telecommunications technology can achieve:

- Facilitate management of the corporation. This can be accomplished through implementation of messaging and conferencing systems and working toward supporting future distributed applications over the corporate network.
- Improve the information-gathering process for operations. Network management and control systems, inventory control systems and distributed data base management systems are useful tools here.
- Communicate vital information effectively. Packet switching, local-area networks, 56K bit/sec and T-1 links and multivendor connectivity can help improve information transfer locally, nationally and internationally.
- Facilitate communications between the corporation and its suppliers and customers. Good approaches include the use of EDI, keeping up with the emerging industry standard protocols, such as the Manufacturing Automation Protocol and the Technical and Office Protocol, and participating in communications standards advocacy groups such as the International Telecommunications Users Group.
- Expand and maintain the customer base. The communications manager can help by implementing a sophisticated telemarketing system or an on-line customer information service. Another application is 24-hour customer direct access to a trouble-reporting and resolution system.
- Develop a cost structure that is substantially lower than the competition's. This can be accomplished by monitoring services and equipment performance. Also, the use of bypass techniques, telecommuting applications and on-line data bases that support quick comparison of the latest carrier tariffs can all help to cut an organization's operating costs.

Besides providing technical expertise and direction, a manager's job is to give the company a strategic advantage through applied technology.

Policy from **page 26**

Monopolized record services must give way to more modern and less expensive alternatives. International standards must be encouraged.

Corporations with overseas locations can pay thousands or even millions of dollars per year for their communications. Managers owe it to their companies and themselves to join the EMA and play a role in establishing communications policies.

Many people working together can contribute toward a common solution. Success in the world of communications means developing a network of smart, reliable management contacts.

The EMA is getting results in improving communications policies and educating users and members of the community. The association can answer questions and help communications managers solve day-to-day problems.

In the 1960s, communications technology was directed at the office. In the 1970s, it was targeted across corporations. In the 1980s, its market is worldwide.

Network managers must become active in setting communications policy. The EMA is the vehicle with which to accomplish this goal.

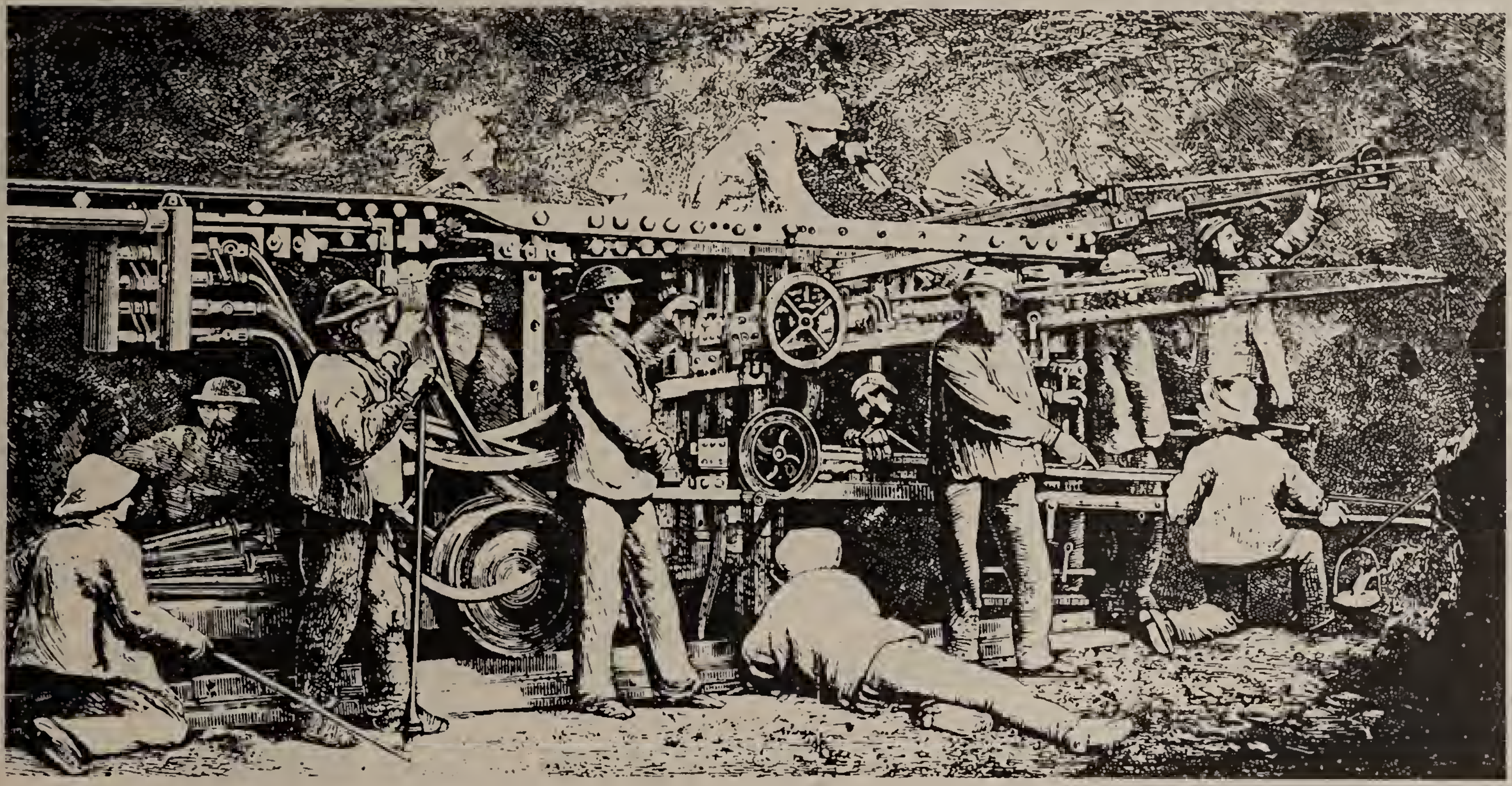
Management from **page 27**

growth, provide self-assessment, design network modifications and account for different service peaks and valleys.

Network management is especially important for organizations trying to merge voice and data networks or thinking about installing an Integrated Services Digital Network. Merging voice and data is a joke without a network management system in place.

Before merging voice and data, each network must be optimized, and a detailed inventory of all the pieces must be created. It's amazing how many large companies cannot produce an accurate inventory of their data and voice networks. Judging from the frequent problems and changes incurred by organizations, not very many networks are optimized.

In the future, the use of network management systems will be applied not only for premise-to-premise diagnostics but for desktop-to-private branch exchange-to-desktop diagnostics. Users who are seeking a true end-to-end diagnostic system must scrutinize vendors that are promoting a PBX-based network architecture to see if they can provide that desktop-to-desktop capability.



▶ TECHNICAL PUBLICATIONS

Hitting pay dirt for the do-it-yourself manager

A guide to the mother lode of telecommunications publications.

BY PAUL F. KIRVAN
Special to Network World

Finding timely, accurate information is one of the most difficult jobs a communications professional has today. Technical journals, magazines and newspapers are fine for news, analysis and product information. But where can a communications manager or network planner find the nitty-gritty details on how to implement a standard or how to connect a device to a carrier's network?

Kirvan is managing director of Paul F. Kirvan and Associates, a telecommunications and data communications consulting firm in Turnersville, N.J.

The growing trend toward customer-owned and maintained networks, both in voice and data, has made it imperative that technical documentation on network-related systems be available to users. Product literature and technical manuals from vendors are sometimes sufficient for installing and maintaining equipment, and loose-leaf reference manuals such as those from FTR, Inc. in Pennsauken, N.J., and Datapro Research Corp. in Delran, N.J., can help managers decide on the products to consider for an application.

However, many managers may be forgetting that AT&T and the regional Bell operating companies are among the best available sources

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From page 31

of technical requirements for communications network managers and planners. A wealth of technical information is available to end users from AT&T and Bell Communications Research, Inc. (Bellcore) on the most critical network communications technologies.

Managers considering, for example, a network upgrade to T-1 or planning a feasibility study on Integrated Services Digital Networks can simplify their efforts with publications that are available at reasonable prices from AT&T and Bellcore.

Each organization offers hundreds of publications, and there is some natural overlap between them. After all, it wasn't so long ago that they were all part of the same family.

AT&T technical publications

AT&T's catalog of technical documents is called Pub 10000. The latest version, dated January 1986, includes descriptions of more than 130 different items. Included are information publications, which provide generalized planning information; compatibility bulletins, which provide interface specifications for manufacturers that build equipment that connects to the AT&T network; and network interface technical standards, the guides that spell out in detail the way T-1 lines and digital access and cross-connect systems (Dacs) operate, for example.

AT&T also publishes the following technical references:

- Pub 20000 — Network Interface Standards Catalog; covers details of network interfaces; now included in Pub 10000.
- Pub 30000 — Engineering and Maintenance Support Catalog; covers publications on engineering subjects; now included in Pub 10000.
- Pub 40000 — Embedded Base Products Catalog; covers customer product information on AT&T products; now included in Pub 10000.

> *“Each organization offers hundreds of publications, and there is some natural overlap.”*

The company publishes two magazines, the *AT&T — Bell Laboratories Technical Journal* and *AT&T — Bell Laboratories Journal* as well as several specialized textbooks, all of which are detailed in the Pub 10000.

Pub 41458 — Special Access Connections to AT&T Communications Network for New Service Applications

The proliferation of voice and data communications facilities from AT&T needs to be clarified with regard to interface requirements from a customer premise to the AT&T central office. This publication describes two-wire and four-wire analog and digital interfaces to the network. Interfaces for DS-1 and switched 56K bit/sec digital services are also described. Applicable for interfaces to networks like Megacom and Software-Defined Network.

> *“A wealth of technical information is available to end users from AT&T and Bell Communications Research, Inc. on the most critical network communications technologies.”*

Pub 41449 — AT&T Integrated Services Digital Network Primary Rate Interface Specifications

This is an excellent explanation of the ISDN Primary Rate Interface. The Primary Rate Interface is typically represented as the connecting link from a customer's private branch exchange to an ISDN serving office. The interface can be used by manufacturers to design equipment that supports ISDN as well as by end users that want to begin planning for ISDN. This publication is a companion to Pub 41459.

Continued on page 33

IBM's new 2,400 bps PC Modems
give you an easy choice:

Either

Stand-alone.
The IBM 5842
2,400 bps Modem.

Either way, you can't go wrong.

With IBM's new modems and a personal computer you can tap into information at a very impressive 2,400 bits per second (bps).

That translates into a binary file transfer speed of nearly 13 K characters per minute—or over six pages worth. Now imagine the impact that can have on your long distance telephone bill.

But these new modems aren't just fast, they're also versatile. They can both send and receive data asynchronously at speeds ranging from 2,400 bps down to 75 bps.

Both modems are compatible with the popular “AT” command set, as well as the IBM command set. And they have been tested for compatibility with leading PC communications software such as Crosstalk™ XVI, Microsoft® Access, Kermit, Smartcom® and Smartcom II®

From **page 32**

Pub 41459 — Integrated Services Digital Network Primary Rate Interface for AT&T Communications
This publication describes the features and capabilities of the AT&T ISDN Primary Rate Interface. It is the logical companion to the definitive Pub 41449, which describes the interface specifications.

Pub 54010 — X.25 Interface Specifications and Packet Transport Network Capabilities
This is a description of the CCITT X.25 recommendation for connection to packet-switched networks. It provides performance parameters and values that users typically encounter. It is an excellent technical description of a standard many network managers are implementing now or will be considering in the near future.

Pub 54012 — X.75 Interface Specifications and Packet-Switching Capability
Users planning multiple packet networks or interconnections with carrier-provided packet networks will need this publication. It explains the CCITT X.75 specifications for connections between two signaling terminals, each of which is part of its own respective packet network.

The publication also describes AT&T's Packet Transport Network and bilateral agreement criteria for interconnection with other public packet-switched networks.

Pub 54015 — Customer Controlled Reconfiguration, a service function of Accunet T1.5
Networks built around T-1 digital channels will benefit from this description of Customer Controlled Reconfiguration, which permits users to reconfigure 64K bit/sec DS-0 components of DS-1 lines dynamically to achieve better use of the facility. This service can help users get the best possible line use and potentially reduce the number of access and internodal lines required.

Pub 54020 — AT&T Communications — Telecom Canada Specification of CCITT Signaling System No. 7
A single loose-leaf volume, this reference describes the signaling channel that is the essence of ISDN. The volume describes Signaling System No. 7, the international standard; CCS7, a version used for communications between the U.S. and Canada; CCIS, the AT&T common channel interoffice signaling standard; and CCIS6, the protocol used in AT&T's CCIS network and based on CCITT Signaling System No. 6. Users who want to

Continued on **page 34**

Directory of pubs

AT&T PUBLICATIONS

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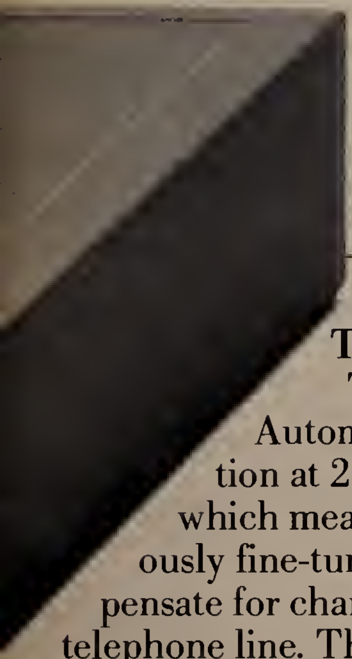

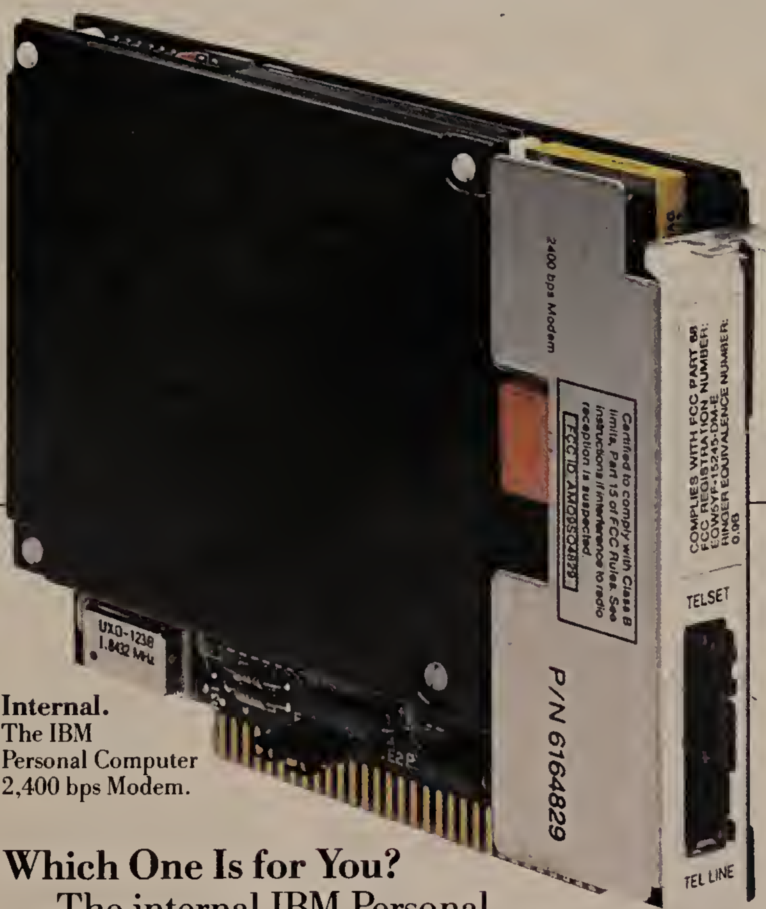

or

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The IBM Personal Computer 2,400 bps Modem.

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These modems feature Automatic Adaptive Equalization at 2,400 and 1,200 bps—which means they will continuously fine-tune themselves to compensate for changes and noises on the telephone line. The result is, you can receive data over a wider range of telephone line conditions.

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understand ISDN thoroughly will want this publication.

Summary of AT&T publications

Publication number	Select number	Publication title	Subject area	Publication date	Unit cost
Pub 62210	326-205	Access Connections to Baseline Offerings at AT&T Central Office	End user methods of connecting to AT&T Baseline services	May 1985	$65
Pub 54010	326-940	X.25 Interface Specs. and Packet Transport Network Capabilities	X.25 specs. for user connections	May 1986	$37
Pub 54012	326-197	X.75 Interface Specs. and Technial Capabilities	X.75 specs. for internetwork connections	May 1986	$37
Pub 54015	326-199	Customer Controlled Reconfiguration in Accunet T1.5 Service	Describes specs. for CCR function	Jan. 1984	$40
Pub 62411	326-217	Accunet T1.5 Service Description and Interface Specs.	Describes T1.5 service in detail	Oct. 1985	$38.50
Pub 41458	326-204	Special Access Connections to AT&T Switched Network	Interfaces for analog (2-W, 4-W) and digital services such as switched 56K	Oct. 1985	$60
Pub 41449	326-272	AT&T Integrated Services Digital Network Primary Rate Interface Specs.	Describes ISDN Primary (23B + D) Digital Interface	March 1986	$115
Pub 41459	326-201	ISDN Primary Rate Interface for AT&T	Describes ISDN features	April 1986	$10
Pub 54020	326-850	AT&T Communications Telecom Canada Spec. of CCITT Signaling System No. 7	Describes SS #7 signaling channel used in ISDN	July 1984	$125
CB 143	326-239	Digital Access and Cross-Connect System Technical References	Describes Dacs system and compatibility	Jan. 1983	$7

Pub 62210 — Access Connections to Baseline Offerings at AT&T Central Offices

Users building private networks using AT&T-provided intra- or inter-local access and transport facilities should use this publication to determine the requirements for connecting to the AT&T point of interface. Connections from the user's premises to the AT&T central office are discussed, as are the transmission characteristics of the AT&T circuits. Information is provided on voice and data circuits alike, ranging up to T-1 speeds.

Pub 62411 — Accunet T1.5 Service Description and Interface Specifications

This is required reading for anyone planning their networks around T-1 facilities. The publication describes the electrical and physical parameters at the network interface, the signaling format and other pertinent information necessary for T-1 implementation. Included are descriptions of DS-1 superframe and extended superframe formats.

CB143 — Digital Access and Cross-Connect System (Dacs) Technical Reference and Compatibility Specification

Dacs are central office-based devices that permit the redistribution of individual 64K bit/sec DS-0 lines and improved testing capabilities at the digital level. Users with many T-1 lines will find this publication useful because it defines the characteristics of Dacs at the DS-1 level that can also be applied to non-AT&T Dacs equipment.

Summary of Bellcore publications

Publication number	Publication title	Subject area	Publication date	Unit cost
TR-NPL-000334	Voice-Grade Switched Access Transmission Parameter Limits and Interface Combinations	Describes requirements for connections to switched voice-grade services	June 1986	$64
TR-NPL-000335	Voice-Grade Special Access Service Transmission Parameter Limits and Interface Combinations	Describes requirements for connections to non-switched voice-grade services	June 1986	$97
TR-EOP-000063	Network Equipment — Building System Generic Requirements	Describes requirements for building telephone company equipment rooms	Aug. 1985	$59.25
TR-TSY-000020	Generic Requirements for Fiber and Optical Fiber Cable	Describes requirements for using fiber-optic facilities	Dec. 1985	$54.75
TR-NPL-000275	Notes on the BOC Intra-Lata Networks — 1986	Describes how BOC Intra-Lata networks are organized; who connects to these networks	April 1986	$150

Bellcore technical pubs

Like AT&T, Bellcore publishes a number of technical publications that are designed primarily for use by BOCs and RBOCs. Bellcore's annual catalog of technical information is called Cat 10000, as distinguished from AT&T's Pub 10000. The latest version is dated July 1986, and includes descriptions of more than 490 publications.

> *“Bellcore publishes a number of publications designed primarily for use by BOCs.”*

Included among them are informational publications, which provide generalized planning information; compatibility bulletins, which offer interface specifications for manufacturers that build equipment for connection to BOC central offices; and technical descriptions and references, which explain, for example, the interfaces for analog and digital communications lines to the network via BOC central offices.

Cat 10000 also includes documentation listings from each of the seven RBOCs, which can be ordered directly from an RBOC.

Other Bellcore publications include a monthly digest of technical information that announces new technical advisories and references, a bimonthly magazine called *The Exchange* and the annual *Catalog of Intellectual Publications*, which provides details on software systems, studies and documentation that have been developed by Bellcore in support of the BOCs.

TR-NPL-000334 — Voice-Grade Switched Access Service Transmission Parameter Limits and Interface Combinations

This volume explains switched voice-grade intra-Lata and inter-Lata facilities for both interexchange carriers and users, the interface details and signaling arrangements. Feature groups A, B, C and D and Wats Access Lines are described. It is an excellent guide to switched voice-grade service offerings for voice and data communications professionals.

TR-NPL-000335 — Voice-Grade Special Access Service Transmission Parameter Limits and Interface Combinations

A companion to the above volume, this publication provides similar interface and signaling specifications for dedicated voice-grade private-line circuits connecting interexchange carriers and end users. Both two-wire and four-wire circuits are discussed, as are important attributes like ground/loop start and ear and mouthpiece signaling.

TR-EOP-000063 — Network Equipment — Building System Generic Requirements

Although described as a planning publication stating Bellcore's requirements for equipment installed in telephone company central office buildings, the publication is an excellent guide to planning communications equipment rooms for medium to large users. It discusses matters such as floor arrangement, cable routing, environmental considerations, lighting and electrical systems.

TR-TSY-000020 — Generic Requirements for Fiber and Optical Fiber Cable

This publication describes Bellcore's view of the current generic and technical requirements and characteristics used in the design and fabrication of fiber-optic cable. It also provides functional design criteria, mechanical and optical requirements and testing methods. There is also a technical introduction to fiber-optic cabling.

TR-NPL-000275 — Notes on the BOC Intra-Lata Networks — 1986

Intra-Lata BOC networks are a complex mosaic of interconnecting facilities and services. This reference gives an excellent description of the technical characteristics and fundamental operating principles of switched inter-Lata networks. It contains descriptions of interfacing arrangements with non-BOC exchange carriers, customer premises equipment, interexchange carriers' nets and cellular mobile carriers.

How to order

First, catalogs from the specific organizations must be ordered over the phone. They are usually free of charge.

Once the catalog has been received, it should be reviewed carefully to determine which publications are needed. In most cases, an order form must be completed with the payment attached. Telephone orders for AT&T and Bellcore publications are accepted. AT&T has a toll-free number, (800) 432-6600.

When ordering AT&T publications, it is important to use the two code numbers on the order form. Indicate both the Pub number and the "select code," which is usually found at the end of the publication's description in the form "326-XXX." This will help expedite the order, especially if several publications are desired. If there is no select code in the catalog, simply use the code associated with the publication.

AT&T and Bellcore provide a substantial selection of technical publications for communications professionals. The costs are generally reasonable, and the publications, particularly those concerned with digital communications facilities, are well-written and current.

The ordering process is easy, and the publications arrive three to six weeks from the time the order is mailed.

For a modest investment, communications or network managers can build a comprehensive library of accurate, easy-to-use technical information that can be invaluable when planning communications facilities and networks.

INTELLIGENT NETS

Domesticating the switch-and-wire beast

Synergy drives the network concept.

Continued from page 1

customers direct control over network resources.

This intelligent network concept is driven by a synergy between user needs and AT&T goals. "The customer's desire for control and flexibility matches our desire to drive costs down and make communications a more important part of customer operations," says Larry Schwenk, AT&T division manager of service and application marketing and competitive assessment.

"As the customer gets more control, our costs go down," Schwenk explains. "When customers assign digital facilities from a terminal, we don't have to handle reconfiguration orders or do engineering work.

"The more cost-effective services become, the more likely it is that customers will use communications to solve business problems."

Ultimately, enhanced services will evolve into Integrated Services Digital Networks. ISDN is nearing reality in the U.S., despite the disservice done it by unrealistic hype.

The concept of intelligent, end-to-end digital networks that support simultaneous voice, data and other types of traffic will be realized and field tested by various Bell operating companies through 1987 and 1988. ISDN may be attainable with off-the-shelf products by the end of the decade.

To support the growing number of services that will eventually add up to ISDN, AT&T has established a strategy it calls "nodal architecture." The concept is to build services around and between switching nodes that will represent the customer's service access point. Once a customer is within an AT&T node, his traffic can be routed to a full range of services.

A large user, for example, may lease a T-1 1.54M bit/sec digital link from a local telephone company or bypass carrier to access an AT&T node. The 24 channels within that digital pipe can be used to support any service.

Changing the appearance of today's T-1 channels requires AT&T's intervention and time. Although faster than the old method of ripping out wires, it is not as efficient as customer-controlled channel reconfiguration or, even better, the ISDN goal of software-controlled reconfiguration.

With ISDN, switches and multiplexers will be able to change the appearance of the digital access channels automatically. One minute, 12 of the 24 T-1 access channels may be serving as AT&T Software Defined Network (SDN) links, and the next minute, they could be defined as AT&T Megacom 800 circuits.

"Your PBX would tell the network every time it sets up a call, 'I want to use this access channel with that service,' " according to Richard Simonson, AT&T service marketing manager.

Although futuristic, these capabilities will be built on a network architecture that is already in place and that underlies many other current and planned AT&T services.

AT&T began implementing that architecture more than 10 years ago, when it established a signaling subnetwork that is separate from its traffic-bearing network and is used to control it. The subnet consists of 30 computers used as signal-transport points that provide Common Control Signaling (CCS).

AT&T is the first of the major long-haul carriers to implement CCS, according to Gerald Mayfield, president of The DMW Group, Inc., a consulting firm in Stamford, Conn. MCI Communications Corp., AT&T's largest competitor, has been working on CCS for more than a year but has yet to announce its support. Similarly, none of the local telephone companies have CCS.

CCS replaced AT&T's older method of in-band signaling. With in-band signaling, switch and line resources were reserved as calls were established. This meant that a call from New York to Los Angeles could tie up network facilities across the country as the call was set up, only to be blocked in California by local traffic congestion.

With CCS, the signal-transfer points can reserve or seize network resources in switch memories, although they do not actually use those resources until an end-to-end circuit is declared ready.

CCS enables AT&T to make better use of existing network facilities by preserving net facilities for calls that can be completed. But, perhaps more importantly, CCS provides the intelligence needed to make enhanced services possible. AT&T's Advanced 800 and SDN services are built on CCS.

Because CCS makes it possible to determine the origin of a call, an Advanced 800 user can route calls from a single 800 number to different locations, depending on where the call was placed, the time of day or the day of the week. The user can also allocate call traffic to different locations on a percentage basis to spread calling loads. Call routing can even be changed from a specific terminal.

Today, AT&T is in the process of upgrading its CCS network to support new services and international ISDN standards. The signal-transfer points used in AT&T's CCS network today were salvaged from old stored program control switches and support the Signaling System No. 6 protocol.

The network communicates 180-bit messages at 2,400 to 4.8K bit/sec and is capable of supporting 2.1 million call attempts per hour.

AT&T has already installed, but is not yet using, new signal-transfer points that will support the CCITT-specified ISDN Signaling System No. 7 protocol. That standard details the type of signaling to be used in ISDN networks.

AT&T's Signaling System No. 7-compatible network consists of 14 AT&T 3B20 superminicomputers that are capable of transmitting 256-byte messages at 56K bit/sec and supporting 12 million call attempts per hour.

According to Perry Youngblood, district manager of AT&T's network operations center, the transition from the older CCS system to the new signal network is expected to be complete in late 1988.

CCS and most other AT&T developments concerning enhanced network services, including ISDN, revolve primarily around AT&T's switched network. This highlights an impending conflict between AT&T and local telephone companies.

AT&T's SDN service is a perfect case in point. SDN, which is based on CCS technology, enables AT&T to build customer networks that provide the functionality of private-line nets but actually use switched facilities. Customer networks are reserved in the memory of AT&T switches, and the circuits are only established when needed. SDN customers dial calls as they would within a private corporate network.

"SDN gives customers the benefit of a private net and allows users to change their networks more effectively than they could in the past," according to Alan Kuritsky, an AT&T district marketing manager.

SDN also provides inherent redundancy. If an AT&T switched service trunk goes down, the customer's service is simply rerouted over another available switched facility. By comparison, downed private lines can require hours or even days to repair.

Although AT&T claims it developed SDN to meet user needs, the service is also satisfying a fundamental goal of AT&T's networking strategy: SDN is defraying operating expenses.

"It's to our advantage and the customer's advantage to get as much traffic on that large public network as possible," Schwenk insists. "Anetwork has a very large set of common costs. You want to spread that over as many customers as you possibly can."

This may bode ill for private-line users. Schwenk says private lines are used for one of two reasons — to take advantage of aberrations in switched network pricing or to support capabilities that switched facilities can't, such as high-speed data communications.

But the price justification is changing. AT&T made $1.5 billion worth of business-service rate reductions this summer, but the company

Continued on **page 37**

HELP IS ON THE WAY...

THE SOFTWARE *connection*

IF you buy and use communications software and find the options overwhelming...or,

IF you sell communications software and you're looking for an effective way to reach buyers...help is on the way.

It's called The Software Connection, The 1987 Communications Software Planning Guide. And it will appear in *Network World's* December 15 issue.

Don't miss this pull-out blockbuster section!

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1

My primary areas of activity. Circle ONE only.

I am involved in evaluating communications (data, voice and /or image) products and services:

1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both

1a

For communications, my primary responsibility is: Circle ONE only.

1. Data Communications
2. Voice Communications
3. Both

2

Circle only the ONE title classification which most applies to you.

Company Management

11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CIO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management

Data Communications

21. Management
    VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
22. Supervisory/Staff
    Supervisor, Head: Networking, Design, Analysis, Engineering, R&D, Applications, Services

Telecommunications

31. Management
    VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks, Engineering, Design, R&D, Application Development
32. Supervisory/Staff
    Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services

Factory Communications

41. Management
42. Supervisory/Staff

MIS/Data Processing

51. Management
    VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of System Design, Analysis, Applications

Others

75. Consultant
80. Educator
85. Financial Analyst
90. Marketing/Sales
95. Other ______

3

Job Function

Which one of the following best describes your functional involvement with communications (data, voice, and/or video) products? Circle ONE only.

Corporate

1. Business Management, Planning and/or Development

Communications System/Network

2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other ______

4

Which one of the following best describes the primary business activity of your organization at this location? Circle ONE only.

Consultants

11. DP/Communications Consulting Services
12. Consulting Services (except DP/Communications)

End Users

13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/Construction/Petroleum Refining/Agriculture/Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local

Vendors

41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, Intern'l Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other ______

5

In which ways do you typically become involved in acquiring communications products (data, voice, and/or video) and services? Circle ALL that apply.

1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6

Check ALL that apply in columns A and B.

A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:

B. These products and services are presently in use at this location:

	A	B	*Product/Services*
Computers			
01.	☐	☐	Micros
02.	☐	☐	Minis
03.	☐	☐	Mainframes
Data Communications			
04.	☐	☐	Communications Processors
05.	☐	☐	Comm./Networks Software
06.	☐	☐	Digital Switching Equipment
07.	☐	☐	Facsimile
08.	☐	☐	Modems
09.	☐	☐	Multiplexers
10.	☐	☐	Protocol Converters
11.	☐	☐	Network Mgmt. & Control
12.	☐	☐	Test Equipment
13.	☐	☐	3270 Controllers
Telecommunications			
14.	☐	☐	PBXs
15.	☐	☐	Key Systems
16.	☐	☐	Central Office Equipment
17.	☐	☐	Integrated Voice/Data Terminals

	A	B	*Product/Services*
Transmission/Network Services Equipment			
18.	☐	☐	Microwave
19.	☐	☐	Satellite Earth Stations
20.	☐	☐	Local Area Networks
21.	☐	☐	Wide Area Networks
22.	☐	☐	Packet Switching Equipment
23.	☐	☐	Fiber Optic Equipment
Communications Services			
24.	☐	☐	Packet Switching Services
25.	☐	☐	Cellular Mobile Radio Services
26.	☐	☐	Electronic Mail
27.	☐	☐	Enhanced Services
28.	☐	☐	Centrex

7

Estimated value of communications systems, equipment and services:

A. which you helped specify, recommend or approve in *last* 12 months? Check only ONE in column A.

B. which you plan to specify, recommend or approve in *next* 12 months? Check only ONE in column B.

	A	B	
1.	☐	☐	Over 10 million
2.	☐	☐	$5-10 million
3.	☐	☐	$1-5 million
4.	☐	☐	$500,000-1 million
5.	☐	☐	$250,000-500,000
6.	☐	☐	$100,000-250,000
7.	☐	☐	$50,000-100,000
8.	☐	☐	Under 50,000
9.	☐	☐	Don't know

8

Estimated gross annual revenues for your entire company/institution:

Circle only ONE.

1. Over $1 billion
2. $100 million to $1 billion
3. $5 million to $100 million
4. Under $5 million

9

Estimated number of total employees at this location:

Circle only ONE.

1. Over 5,000
2. 1,000-4,999
3. 500-999
4. 250-499
5. 100-249
6. 50-99
7. 20-49
8. 1-19

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From **page 35**

increased private-line rates by 3.3%. AT&T's economic incentive to base services on switched instead of dedicated lines, combined with technological developments that enable the company to mimic private-line services using switched facilities, raises questions about the future of private lines.

AT&T insists it needs to maintain a range of services. "We're offering Chevettes, Impalas and Corvettes because there are different segments of the market," Kuritsky says.

However, the question is whether private-line Impalas become Corvettes as AT&T strives to meet its strategic goals.

Another dark cloud on the horizon is an apparent conflict between AT&T and local phone companies.

Although AT&T is striving to migrate as much traffic as possible onto its switched network, it is encouraging customers to access its advanced services with T-1 links leased from local telephone companies or bypass carriers. The flexibility offered with T-1 links is greater, as is the cost saving.

But perhaps of more importance to AT&T, leased access helps prevent local telephone companies from treating AT&T as a commodity bandwidth provider.

Local telephone companies are driven by the same economics as AT&T and want users to adopt switched services. Because of this, they are opposed to the idea of having their customers trade the switched facilities they use to access AT&T for dedicated T-1 links.

To counter that threat, the strategy of local telephone companies is to provide enhanced services within their local access transport areas and enable customers to interconnect these Latas with the long-haul carrier of their choice.

Is there going to be a war? "If your reference point is AT&T and the Bell System before divestiture, then this certainly looks like a conflict," Schwenk asserts.

"But you have to accept that the industry has a different shape now, and all the players are taking the businesses they are in and looking for ways to present those effectively to the customer."

Regardless of the outcome, the short-term effect for users is confusion. "There are probably conflicting proposals in front of customers," Schwenk admits. "But I'm not sure that is necessarily bad.

"Telecommunications competition is good news and bad news. The good news is that you have lots more choices, and the bad news is that you have to make choices."

Confusion aside, competition between suppliers of enhanced services will benefit the consumer by necessitating vendor flexibility.

AT&T will have to give a little because it isn't the only game in town anymore. AT&T's Schwenk says special deals are characteristic of a competitive world.

"A big company like us has to be careful about making deals. It can affect our costs," he says. "But it doesn't mean we shouldn't do it. It is a recognized customer need."

> *"Telecommunications competition is good news and bad news."*

Trends from **page 26**

breathtaking inability to develop software. Elsewhere, starts were made, but they were a collective drop in the bucket. The industry was paying the price of its own specialization: It was out of sync with what was happening in its market.

A recession hit the industry, although it varied from company to company, place to place, market segment to market segment. When things began to look up, there was a feeling that the worst might be over.

It might be. There are some positive signs. The companies that are doing best, such as DEC, are those that have laid a strong emphasis on networking. The various standards efforts give reason for hope, and perhaps the motley collections of uneasy allies behind the International Standards Organization's Open Systems Interconnect model, Manufacturing Automation Protocol/Technical and Office Protocol and the local-area network standards movements can create a genuinely open environment. This would be a start, although it would still take years for attitudes to change and for a sufficient base of generalist skills to develop.

Maybe it can be done. But the challenge of restructuring the computer and telecommunications industry is not a small one, and history shows that the marketplace is cruel to those who fail to adapt.

Ask anyone in Allentown, Pa., about that.

Letters:

Broadband blunders

The article,"Jumping on the broadband wagon," (*Network World*, Sept. 15) incorrectly listed the lowest cost per port of the Allen-Bradley Vistalan/1 system as $850. This in fact should be $312.50, which qualifies it as the lowest cost per port of any of the RE-232 networks listed in the article.

This price includes all hardware and software (firmware) for the unit to function. The only other components necessary for a complete system would be a head-end translator and the broadband cable system itself.

Another error in the listings is the reference to data protocol. While many of our products do support synchronous protocols (SDLC, BSC, etc.), the Vistalan/1 product line does not at the present time.

I appreciate your attention to this rapidly growing medium and hope that we will see more such articles in the future.

Fred Gruhl
Director of marketing
Allen-Bradley Communication Division

Editor's note: The price and protocol support level information was obtained by the author from a member of Allen-Bradley's Communication Division Marketing Department at the company's Industrial Computer Group in Ann Arbor, Mich.

Dialing for dollars

I enjoyed the article "Modems may trip up 800 lines," (*Network World*, Sept. 22) and basically agree. However, there are two areas that, while accurate, are misleading.

First is the description on page 22 of how the hunting equipment works. While it may function as described, it need not. Trunk hunting can be on a rotor. When this hunting scheme is used, the equipment starts its hunt with the line after the last connection. Using the example given, if line 4 did answer but failed to connect, the next caller would start his or her hunt with line 5, not line 1, and would be connected with the first available line after that point. When the first caller tried again, his or her hunt would start one line after where caller 2 was connected, assuming no other callers.

The other area of concern is on page 23 where the testing procedures are described. It states that "If the number dialed is malfunctioning or busy, the telephone company equipment may automatically connect to the next number in the group." While this is true, it does not have to work that way and again is misleading. Properly established hunt groups have individual numbers assigned to each line and are all linked together by a common pilot number. The pilot number is usually the first number in the group. However, when properly established, each number in the group, except the pilot, can be dialed directly and will not hunt to other numbers.

Equipment at both the telephone company and at the customer site is improving the capabilities in these areas. Conditions such as Kelly described do exist. The customer should investigate what capabilities are needed and what his local telephone company can provide.

If the available services are not adequate, he may then want to investigate alternatives, if the unavailable features are cost-justified.

James R. Wheeler
Independent Dental Consulting
Paw Paw, Mich.

Divestiture view

The interview article titled "Management pro speaks out" (*Network World*, Sept. 29) states that, "The AT&T case was interesting because the entire evolution of an industry was being carved up by one judge in Washington, D.C."

The truth, which is almost totally ignored, is that the AT&T divestiture was an agreement between the U.S. Department of Justice and AT&T. Not only that, but [U.S. District Court] Judge [Harold] Greene first heard that the case was settled (after spending hundreds of hours on the bench listening to both sides) when he read about it in a newspaper purchased at an airport as he was returning from a vacation!

In truth then, Judge Greene didn't carve up anything. He does preside over the administration of the Modified Final Judgment, but only to render antitrust judgements. Few care to recognize that the Modified Final Judgment and its continuing enforcement is the result of an almost decade-long antitrust action by the Department of Justice.

Few also care to admit that the Bell operating companies, wherein most of the alleged anticompetitive activity took place, were then and now separate subsidiaries — only the parentage has changed. It is precisely this opportunity for anticompetitive activity that gave rise to the line of business restraints in the Modified Final Judgment.

As far as the question of whether the Federal Communications Commission should oversee the regional Bell operating companies, the Justice Department is one with the FCC in wanting regulation to be the province of the FCC.

I repeat my position that the court is not even remotely regulating anything. The court is administering an antitrust agreement.

The expert did mention "antitrust" in her response. However, her comment indicates a change from the antitrust premise. I do not believe that there is any factual evidence supporting a change in viewpoint of the court.

Jim Carroll
Vice-president
Government Relations
Litel Telecommunications Corp.

Letters may be edited for space and clarity.

▶ INTERNATIONAL ISSUES

Geisco president calls for world user freedom

"It's time to level the playing field."

BY KARYL SCOTT
Washington, D.C. Correspondent

ROCKVILLE, Md. — National trade and regulatory policies are holding back users and hampering the development and deployment of communications technologies, the newly appointed president of General Electric Information Services Co. (Geisco) charged last week.

Anthony Craig, who recently came from London, where he served as Geisco's senior vice-president of international sales and service operations, said in an interview with *Network World* that communications users must be free to choose products and services that best suit their business interests. But narrowly focused national policies often shackle users, he said.

Craig, who became president last month, replaced Walter Williams, who was promoted to senior vice-president of corporate marketing and sales for General Electric Co.

Geisco provides teleprocessing and network-based services to corporate customers worldwide. Craig worked overseas for three years, managing all of Geisco's international activities, including cooperative agreements made with firms in Japan and the UK. Prior to joining Geisco, Craig worked for IBM for 17 years in Toronto, Paris and the U.S. He served as OEM sales director and director of marketing for IBM's Distribution Channels Business Unit.

Craig called on all nations to recognize the increasingly global nature of communications and to foster information policies that advance communications technology. Having been involved in Geisco's attempts to forge relationships with various Post Telephone and Telegraph administrations (PTT) around the world, Craig understands the difficulties large companies face in setting up international communications links.

"Companies need and are demanding interconnectivity on an international basis," he observed. "They want a variety of services, flexibility and cost-based services. Many U.S. firms are shocked at the cost of telecommunications in Europe when they first try to set up offices there. Costs are artificially high and the PTTs have a captive audience. It's time to level the playing field for fair and equal provision of services internationally."

Nations that today have protectionist policies to ensure the success of their own national telecommunications companies stand to lose the most, according to Craig. Nations have to realize that the health of their economies will depend on their ability to participate in an international arena. Closed-door policies are going to drive away foreign investment and close foreign markets to those nations and their businesses, Craig said.

"A nation's economy will depend upon the deployment of communications technology," he continued. "International companies need quick and easy access to communications systems in order to compete and succeed in the international marketplace. If they can't get that in one country, they will go elsewhere," Craig said.

Carolina from **page 2**

vice continued to rise. "Now, we feel we've made educational TV affordable for the state of South Carolina for the next 20 years."

Lightle said the state can use the microwave system in the future as a backbone for its intrastate, interlocal access and transport area telecommunications network. Or, he said, the state can use the threat of implementing its own in-state long-haul network to obtain more attractive rates from long-haul carriers.

"We have leveraged the state's options to the hilt," he said. "We can complete our own network now, or we can let the vendor community come in with a cost-effective service." South Carolina now gets most of its inter-Lata long-distance service from TSI, Inc., a South Carolina-based carrier.

Within the next year, South Carolina officials hope to have all the state's 12,000 data terminals hooked into the statewide network. Currently, the state has 16 separate data networks, the largest of which have already been integrated with the voice network.

The catalyst for South Carolina's network consolidation was a 1981 legislative initiative establishing the Division of General Services. This organization, which assumed responsibility for the state's telecommunications, data processing and office automation operations, was charged with producing a report by January 1983 on improving productivity and lowering state costs by merging information technologies.

Later, the Division of Information Resources Management was established and assumed most of the responsibility for managing the state's information and communications services.

Lightle credits the foresight of a number of South Carolina public officials with establishing the state's progressive information services policy.

"We had some insightful legislative and executive branch leaders in the late 1970s who said the state better do a better job in this area." Lightle said. "We were one of the few states that defined information technology as data processing, telecommunications and office systems and addressed the convergence of those technologies. Now everybody is saying 'Hey, that's the way the world is going.'

"We've not only addressed the development of our technical infrastructure, we've addressed the management structure for planning, acquiring and managing our information technology," he said.

Lightle is a 27-year veteran of the Bell System who joined the state in 1982.

▶ TELECOM POLICY

Hands off, big brother

Reagan camp endorses laissez-faire.

BY KARYL SCOTT
Washington, D.C. Correspondent

RESTON, Va. — Telecommunications is too important a resource to be left in the hands of governments and entrenched monopolies, Bruce Smart, undersecretary for international trade at the U.S. Department of Commerce, said last week.

That viewpoint may sound strange coming from a government official, but Smart's comments seem to reflect the current posture of the Reagan administration toward domestic and international communications. Smart was one of a number of government representatives to discuss the U.S. stance on international communications policy at the WorldCom '86 conference held here last week.

Issues such as who should control communications networks, who should have access to them and at what cost are among the key questions dividing the U.S. and foreign nations.

Smart said the U.S. government believes all communications markets should be open to all participants.

"Restrictive telecommunications policies will leave users in a losing position," Smart said.

"Government control over telecommunications networks and markets limits user choice, increases the cost of service and equipment, retards the modernization of networks and puts pressure on ratepayers."

The U.S. hopes to foster an international telecommunications policy that promotes the free flow of information and the development of open markets, said Thomas Ramsey, deputy director of the Bureau for International Communications and Information Policy in the Department of State.

The U.S. has wielded its economic and technological dominance to influence other nations' telecommunications policies, said Vincent Hill, director general for telecommunications policy in Canada.

"We have been strongly affected by the U.S., whether we like it or not," he said.

Merger from **page 2**

of packet network options, including vendor-administered networks, partial packet networks and so-called value-added networks. General Electric's own General Electric Information Services Co. was not considered because, Harrelson said, it wasn't fully deployed at the time of the bid.

He said GE Semiconductor chose the Paradyne Sesa 5200 private packet network because it could be operated by GE Semiconductor personnel using the company's own resources, a factor that lowered costs considerably.

The merger sparked a change in the location of the packet network hub site from here to the new GE Semiconductor Business commercial division in Somerville, N.J. Circuits to Brussels, Belgium and other planned European and Far East installations will also connect to Somerville.

Harrelson's telecommunications team has already begun the interconnection of the former RCA Solid State facilities. International circuits are expected to be connected by the end of 1987. Some retrofitting of an existing, lower volume Dynapac packet network at RCA Solid State sales facilities is already under way. Harrelson said he expects installation of the packet network, which is valued at approximately $1 million and will sustain ongoing leased line charges of about $500,000 yearly, to be completed by the end of 1987.

Harrelson works with communications managers in several GE Semiconductor Business locations. Communications staff at GE/RCA Solid State locations and managers within several of that company's wholly owned businesses, such as Cupertino, Calif.-based Intersil, Inc., Custom Integrated Circuits located here and the Syracuse, N.Y.-based Power Electronics division, are included in corporate packet net planning.

To cope with the variety of communications management teams in the newly merged business units, Harrelson set up a task force to oversee the packet network installation and develop an overall management strategy.

Harrelson said managers shouldn't be intimidated by a corporate reorganization. "It can hurt a business if management neglects to take a leadership role," he added. "The company hired you for your expertise and your ability to get things done. They still look to you for that expertise even in difficult situations like a merger."

AT&T from **page 1**

Bank of America's plans to build a statewide data network to support Automatic Teller Machines (ATM), branch office teller machines and other administrative and remote devices.

According to Alan Schaevitz, director of the San Francisco office of Network Strategies, Inc., a Burke, Va.-based consulting firm, the bank intended to install Doelz equipment to multiplex the different protocols used by ATMs and other remote devices into an integrated data stream.

Schaevitz said the Doelz boxes take different protocols and packetize them into a common background protocol for transmission. In effect, the product looks like a multiplexer with a packet assembler/dissassembler built on top of it, he explained.

"At the host end you would have another Doelz box that breaks the data stream back out into individual protocols," Schaevitz said.

Initially, the bank was going to integrate Doelz equipment into a backbone network using T-1 1.54M bit/sec digital facilities.

Because the Doelz hardware can support a maximum transmission speed of only 56K bit/sec, the bank planned to add another network tier of NET T-1 multiplexers.

The multiplexers would provide the 56K bit/sec backbone Doelz circuits as well as voice circuits to the bank's branch offices.

NET net dovetailed

The NET T-1 network dovetailed with a project IBM is working on for the bank. According to a source who is close to the deal, IBM has been helping the Bank of America with the development of its Universal Data Network architecture for two years.

That project involves a transport subsystem similar to that proposed by NET, atop which IBM would build a "complex, complete architecture essentially based on an LU 6.2 foundation," the source explained.

Eventually, the shared IBM Systems Network Architecture network would enable the bank to consolidate all retail banking applications.

Although AT&T could not hope to compete for the IBM half of the deal, when it learned of the data communications angle, it organized a marketing "Swat" team to pitch its solution directly to Lewis Mertes, the bank's executive vice-president of MIS.

AT&T's T-1 advantage

AT&T touted its Datakit Virtual Circuit Switch against the Doelz equipment and apparently won. Besides the reportedly "sweet deal" AT&T was willing to give the bank on the Datakit hardware, the equipment offered the additional advantage of supporting T-1 speeds.

"With direct T-1 support you don't need a second tier T-1 multiplexer to bring the speed down to 56K bit/sec," said one analyst who requested anonymity. Without the data circuits the NET equipment was going to support, it is questionable whether the bank needs the NET gear.

"Without the data circuits you don't need the sophistication of a NET switch," the analyst said.

"In taking that business away from Doelz, AT&T took the underpinning out from under NET," he continued.

A source close to NET said, "The company is under contractual obligation to Bank of America and its involvement is the same as it has always been. It is a confusing situation at the bank right now."

US Sprint from **page 1**

stands to inherit all of Honeywell's communications business from AT&T and other carriers. In this scenario, US Sprint will provide the T-1 1.54M bit/sec digital facilities used to interconnect the 11 tandem switches in Honeywell's backbone network, insiders said, as well as providing Virtual Private Network service to hook Honeywell's individual corporate sites into the T-1 backbone.

"We understand it will be a total swap-out," Don Sinnar said of Honeywell's decision to go with US Sprint. Sinnar is vice-president of network sales for Dallas-based Advanced Business Communications, Inc. (ABC), a tandem switch and network vendor.

Last May, ABC acquired Honeywell's communications network division, which manufactures the Road Runner tandem switching equipment Honeywell still uses in its backbone net.

Sinnar claims that Honeywell's network includes some 4,000 circuits and is second only to the National Aeronautics and Space Administration's Road Runner net in terms of size. ABC has an installed base of 230 private networks. Only AT&T has more, Sinnar said.

While not naming Honeywell, Dave Dorman, US Sprint vice-president of national accounts in Atlanta, said, "Several Fortune 200 companies have given us the opportunity to be their primary carrier." Many of these accounts have been signed in the last two months, he said.

"I think it is a ground-swell reaction to the realization that we weren't kidding about our network," Dorman said.

US Sprint has committed nearly $2 billion to the construction of a 23,000-mile, nationwide fiber-optic network. According to Dorman, almost 13,000 miles are currently in place. By the end of 1987, the carrier anticipates having 20,000 miles of fiber installed, giving it the ability to serve all of the major local access and transport areas in the country. The network is slated for completion in the first quarter of 1988.

"I believe there is an acceptance on the part of major corporations that there is an alternative to AT&T, and it's not a discount provider," Dorman said. "It is a provider who understands quality and response and the support that those large users need."

US Sprint's National Accounts Division has grown in revenue by 225%, when compared with the combined national account revenues of GTE Sprint Communications Corp. and US Telecommunications Corp. prior to their merger. US Sprint was formed by that merger.

Failure from **page 4**

breaks is the server," said Mark Tebbe, president of Lante Corp. of Chicago. Disk drive crashes are the most common and serious server problem, with failures frequently caused by overheating, Tebbe said.

Users often crowd a server with add-in boards that are installed close to the computer's bus, or pile things around a server, causing it to overheat.

Servers have a higher duty cycle than any other device on the network. This puts tremendous pressure on a server's disk drive. Actuators, disk controllers and the media itself are all subject to extra wear and tear, and thus to failure. Using a tape backup system consistently can minimize data loss, but most net designers agree that users are lax about backup.

Power supplies are another weak point in personal computers and can cause headaches if they fail. Bornheim said a client using a Compaq Computer Corp. 286 as a server had a problem in which "for some reason the power supply would die and then come back to life and reboot the server." This would happen up to 10 times an hour, Bornheim said, and the client was losing data the network operating system had cached, but had not saved to disk.

A power failure can also affect workstations. Network parameters, including addresses, that are kept in random-access memory can be scrambled when a network station is brought back on line, said Mitre's LaBarre.

Isolating and fixing problems is part of local-area network management, a topic receiving increasing attention from users as their networks grow in size. Although the International Standards Organization last month took a major step toward providing standards for local-area network management, it will probably be at least three years before these standards are finalized, according to Will Collins, a member of the ISO local-area network management working group and principal engineer at Codex Corp. in Mansfield, Mass.

At a recent meeting in England, members of the local-area network management working group presented draft proposals for a network management framework. The framework covers a number of local-area network management areas, such as configuration, fault management, performance, accounting and security.

Although management products based on the ISO standards are years away, many vendors currently provide some type of local-area network testing and diagnostic capability with their products. IBM, for instance, has gotten high marks from users for the Token-Ring Network's self-diagnostics.

In addition, protocol analyzers from companies such as Hewlett-Packard Co., Excelan, Inc. and Network General Corp. allow users to monitor traffic on their networks. These analyzers are frequently used to determine network performance but can also help identify problems with cabling, network interface boards and other components.

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▶ PROFILE

ICA counsel champions users' cause

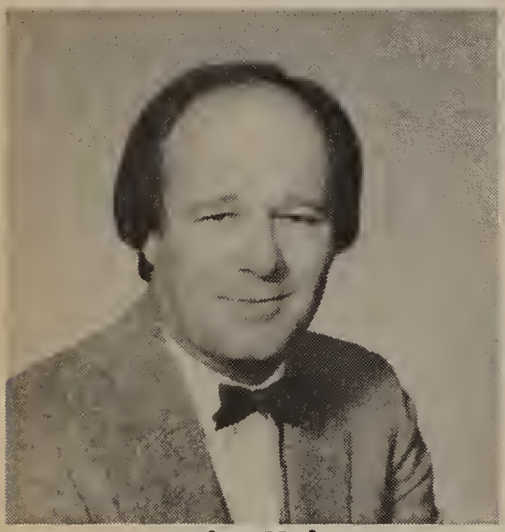
Brian Moir talks telecom in Washington.

BY MARGIE SEMILOF
Senior Writer

WASHINGTON, D.C. — Although Brian Moir's former careers as both a ski racing instructor and an investment banker were demanding, their rigors paled in comparison with the trials of battle on Capitol Hill.

Moir, senior counsel for the International Communications Association (ICA) and partner with the Washington, D.C.-based law firm of Fisher and Wayland, has long since hung up his skis. He now devotes most of his time to racing about Washington for the benefit of the industry's largest and most powerful communications user organization.

The Pasadena, Calif., native has been steeped in communications litigation since the mid-70s, including stints as a legal counsel for Tele-Communications, Inc., a cable television and former microwave carrier, the Federal Communications Commission and a variety of other special interest organizations based here.


Brian Moir

While working on Capitol Hill for both the FCC and Congress, Moir was intimately involved with users campaigning for the right to experiment with communications innovations. "Most of the users pushing for changes were the small entrepreneurial outfits and users within the telecommunications industry," Moir recalled. "It wasn't always the large companies that applied new technology."

Moir has seen the emphasis on telecommunications increase in Washington. Although he has other clients, since 1981 he has mainly monitored public policy for the ICA, representing users' interests before Congress, the FCC, the National Association of Regulatory Utility Commissioners and international forums such as the Consultative Committee on International Telephony and Telegraphy.

He regularly runs ICA public policy committee meetings staffed by user volunteers.

Although Moir has little contact with communications equipment vendors, the ICA and vendors will occasionally lock horns over public policy issues. One of the more significant battles, he recalled, involved determination of ownership of embedded cable following the divestiture of AT&T. Moir and other ICA staffers fought to develop both a transition plan and a right-of-sale plan to counterattack AT&T's push for the immediate deregulation of embedded wire.

"Our views are in the interest of both users and [AT&T Information Systems] stockholders," he said. "By developing a transition plan — which Attis didn't want — by having that transition plan stretch out over a two-year period — which Attis didn't want — and by allowing users the right-of-sale, you have a longer, more secure period of revenue produced by leasing.

"On a phase-in basis, the plan enabled AT&T to react better to customer needs," he added."With a few exceptions, such as issues involving central office equipment, ICA will take as much credit as anyone for the success of Attis. Our policies did more for their bottom line than their policies would have, had they been approved. Now that may draw some colorful responses, but factually, they cannot quibble with the numbers."

Moir currently is working to help users arrest the mounting confusion stemming from changing local rates and billing practices. He wryly observed that some policy-making agencies may be adopting views that clearly benefit the seven regional Bell operating companies, rather than American industry.

"We see the FCC moving away from cost-based pricing in the area of dedicated circuits and special access charges," he said. "Last year, for example, the FCC allowed a bureau chief to approve strategic pricing for special access." Special access tariffs govern the price that long-distance companies pay local carriers for private-line access to the local network.

"There needs to be a lot of education in this industry," he said. "Issues such as the Modified Final Judgment, cost allocation, Computer III proceedings and accounting proceedings are all affected because they are all interwoven." Education has become one of the ICA's leading areas of interest. In fact, the group spent over $300,000 last year to fund university education programs and develop seminars for presentation within user company locations.

Moir's own educational background is as varied as his career. He graduated from the College of Wooster in Ohio and the University of Vienna in Austria with a bachelor's degree in political science. After a brief stint as an investment banker at Bankers Trust in New York, he attended law school at the University of Denver.

"Sometimes the user community or other sectors in the communications industry feel there isn't enough awareness in certain areas," Moir said.

"We can't grouse about it. We can only put our noses to the grindstone and be sure to do a better job of educating. I'd like to see less emphasis on the amount of time we devote to the FCC. Maybe our educational efforts will be more successful next year, and we won't have to focus on them."

Moir said continued education will also help ensure a continuing supply of informed communications managers moving into leadership roles within the user community. He notes the trend toward merging of voice and data functions within many organizations and the growing level of sophistication among managers. But users, he said, must continue to be trained in both the business and technical aspects of communications.

"Communications managers have become managers in the true sense of the word," he added. "But that process was taking place long before divestiture. Divestiture just pushed things along."

Reshuffle from **page 1**

tures. Since divestiture, the company has diverged into a wide range of computer markets with only limited success. The new ventures have contributed heavily to research and development and marketing costs, but have failed to generate revenues commensurate with the heavy outlay.

The company is reassessing its market efforts and retreating before sustaining greater losses. "Certain products that were under development will never come out now," a source said.

The fate of some members of AT&T's computer line is in question. Neither the 7300 micro system nor the bulk of the 3B minicomputer line has sold well. Although the line in general has not yet generated acceptable profits, AT&T feels computers are a necessary part of networking.

Given that stance, AT&T computers will probably be marketed as part of a complete networking package in the future. In such a scenario, the 3B and 6300 microcomputer lines could be packaged with AT&T's Starlan local network or the Premises Distribution System.

In September, AT&T announced a voluntary severance package, called the Management Incentive Program (MIP), aimed at reducing its population of middle managers. The program called for employees volunteering for retirement to receive a portion of their annual salary commensurate with their years of service in the company. The company would not specify the number of employees targeted for voluntary severance, or when they will be taken off the payroll.

According to *Network World* sources, targeted employees were offered the severance plan around Oct. 16, after AT&T had assessed the overlap of employees from the Communications and Information Systems divisions. The company reportedly asked workers to respond to the offer by Nov. 5, and expects to have all takers off the payroll by Dec. 10.

MIP classifies employees

The MIP contains four employee classifications, two protected, two unprotected. Protected employees are allowed to remain with AT&T, but are required to change jobs. Some are receiving assistance in seeking another position within the company; others must do so on their own.

Unprotected employees are asked to accept the severance package, but among those, one group, probably technical staff members and others considered valuable, will be permitted to take other positions within the company, should they find them.

AT&T is allegedly aiming at so-called third level managers and above — a group that includes district managers, division managers and directors — primarily within the Computer Systems Division of the Business Markets Group.

Last week, AT&T said it will assess the impact of the program in January and decide on further moves.

An AT&T spokeswoman said MIP is not aimed at specific management levels, and that there is no target number of layoffs. AT&T would not comment further on its plans. But insiders said the company may lay off more than 100,000 employees, and if the MIP does not pare down the staff by as much as anticipated, AT&T will also trim the ranks in second-level management, consisting of product managers, also.

Changes overdue

Although these moves will leave tens of thousands jobless, the general industry consensus is that changes are long overdue at AT&T and that product and staff trimming will greatly enhance the company's competitive profile.

As one leading industry analyst, who asked not to be quoted, said, "This is a normal course of events in any company's history. AT&T has realized it is not a general purpose computer company, and it is now moving back to its original focus."

Users from **page 8**

with AT&T's rate of return," Montgomery said. "And the costs should be documented. In this case, neither of those conditions appear to be satisfied."

Attorney James Blaszak, who represents the committee, said the petition is important because the figures offered by AT&T in support of its cancellation charge contradict the long-haul carriers' claims.

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Calendar

Oct. 23-24, San Francisco — Data Communications and Networking for the IBM PC XT/AT and other Compatibles. Also, Oct. 27-28, Denver; Nov. 6-7, Raleigh, N.C.; Nov. 20-21, Washington, D.C.; Dec. 15-16, Boston. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

Oct. 30-31, Sunnyvale, Calif. — Advanced Communication Architectures Seminar. Also, Nov. 18-19, New York; Dec. 11-12, Boston. Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

Nov. 2-5, Phoenix, Ariz. — ADAPSO's 25th Anniversary Management Conference. Contact: ADAPSO, Suite 300, 1300 N. 17th St., Arlington, Va. 22209-3899.

Nov. 2-6, Dallas, Tex. — Fall Joint Computer Conference. Contact: The Fall Joint Computer Conference '86, 1950 Stemmons Freeway, Dallas, Texas 75201.

Nov. 3-6, Greenville, S.C. — Automated Manufacturing 1986 (AM86). Contact: Conference and Exhibition on Automated Manufacturing, P.O. Box 5616, Greenville, S.C. 29606-5616.

Nov. 3-6, Washington, D.C. — Modern Data Communications. Contact: The George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

Nov. 6-7, Chicago — Executive Introduction to Telecommunications. Contact: TeleStrategies, 1355 Beverly Road, McLean, Va. 22101.

Nov. 9-10, Chicago — AT&T Futures: A 1990 Outlook. Contact: Gartner Group, Inc., 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

Nov. 10-11, Arlington, Va. — Voice/Data Integration: Practical Approaches. Contact: United Communications Group, Suite 700N, 4550 Montgomery Ave., Bethesda, Md. 20814.

Nov. 12-13, New York — World Update: Winners' Circle '87. Contact: The DMW Group, Inc., Seminar Division, 2020 Hogback Road, Ann Arbor, Mich. 48104.

Nov. 12-14, Boston — SNA Architecture and Implementation Seminar. Also, Dec. 3-5, Sunnyvale, Calif. Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

Nov. 12-14, Boston — Northeast Lightwave Exposition. Contact: Lightwave, 235 Bear Hill Road, Waltham, Mass. 02154.

Nov. 13-14, Los Angeles — Networking Personal Computers. Also, Dec. 15-16, New York. Contact: New York University, School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

Nov. 13-14, Chicago — Data Communications: The Fundamentals of Network Design. Contact: Digital Consulting Associates, Inc., 6 Windsor St., Andover, Mass. 01810.

Nov. 13-14, Washington, D.C. — Satellite Technology for the Non-Technical Manager. Contact: Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

Nov. 17, New York — Data Broadcasting Technology. Contact: Waters Information Services, Inc., 34 Chenango St., Binghamton, N.Y. 13901.

Nov. 17-19, San Francisco — Managing the Strategic Data Planning Project. Also, Dec. 17-19, Boston. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

Nov. 17-19, Atlanta — The Thirteenth Annual Computer Security Conference. Contact: Computer Security Institute, 360 Church St., Northborough, Mass. 01532.

Nov. 17-20, Salt Lake City, Utah — Eighth Interservice/Industry Training Systems Conference. Contact: Col. P.J. Cole, National Security Industrial Association, Suite 901, 1015 15th St. N.W., Washington, D.C. 20005.

Nov. 18-19, Boston — PC Coordinator Workshop. Also, Nov. 20-21, Detroit and Washington, D.C.; Dec. 11-12, Detroit and Los Angeles. Contact: System Resources, 123 North 4th St., Minneapolis, Minn. 55401.

Nov. 19-20, Boston — Educational Seminar on T-1 Facilities and Networking. Contact: Timeplex, Inc., 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675.

Nov. 19-21, San Francisco — Bypass Networking with Small Satellite Terminals. Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402-2899.

Nov. 20-22, Chicago — The Sixth Chicago Computer Business Equipment Showcase. Contact: The Interface Group, 300 First Ave., Needham, Mass. 02194.

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HORRELLSCOPES

BY EDWARD HORRELL

In communications today, it takes more than just good business sense to survive; it requires celestial guidance.

Gemini: The twin personalities of Northern Telecom, Inc. and Apple Computer Corp. are working well together.

Variety is the spice of life for Gemini. And variety is definitely a liking of that fickle suitor, Northern Telecom.

After much speculation that Digital Equipment Corp. was the apple of Northern Telecom's eye, it now appears that the communications giant is courting another.

Northern Telecom's SL-1 private branch exchange and Apple's Macintosh computers are being linked through a joint effort of the two firms.

PBX firms and computer companies have found a galaxy of gold in joint marketing and development. Apple has been coming out strongly in the business community with the Macintosh and apparently has become a star to Northern Telecom.

This may leave DEC as the proverbial bridesmaid who is never a bride. Looks like, once again, DEC has been rejected.

Consistent with their sign, Geminis — like Northern Telecom — fall in and out of love nearly every week. Perhaps this association with Apple is nothing more than a product liaison and not a step toward the altar.

Leo: The sign of courage shines over the North American Telecommunications Association (Nata).

Leo's coat of arms stands for courage. Those born under Leo never retire from the contest when the fight is for the right. And of all the trade associations, Nata might just be the king of the jungle. In November, Nata's pride of members will be meeting in St. Louis.

Many trade shows have outlived their usefulness. But the Nata conference isn't just another small planet in the universe. It is *the* conference for the telephone equipment companies themselves.

Nata commands an aura of respect in the industry. It is a unified organization that attracts top telecommunications companies and carries significant clout in the political world as well.

This wallop is nice to have at a time when the U.S. Department of Justice, Congress and foreign countries such as Japan and France are all assaulting the telecommunications industry. Nata is a group with strong leadership. It has been a leading advocate of a free and open market, and it holds its ground — often winning games of logic against unarmed opponents such as state public service commissions.

The Nata conference will feature exhibits from companies that provide telephone and related systems to the market. And what better place to find out what is new in this galaxy than at this conference?

Stargazers at the Nata conference should watch for plenty of talk about slim profit margins in the industry, a constellation full of new products and the start of some new jobs as resumes are placed in orbit.

Taurus: Communications managers are advised to get account codes by the horns.

The sign of Taurus controls those who see stimulating challenges in the obstacles that would discourage the average person. And discouraged describes the unwary user who finds his authorization codes used by the unauthorized.

Such has been the case lately in some surprising instances, as in college athletes making thousands of dollars worth of bogus long-distance calls. MCI Communications Corp., for example, has reportedly filed charges against the University of Miami for reimbursement of more than $5,000 worth of unauthorized calls by athletes.

The point here for communications managers is clear: Authorization codes of all types should be closely guarded secrets. Don't assume employees "wouldn't do that type of thing." They will.

Just as no coach would give out the playbook, so the communications manager should keep the access codes locked up.

Cosmic Catastrophe of the Month

Move over Amway, Avon and Tupperware. A new pyramid marketing scheme has been born.

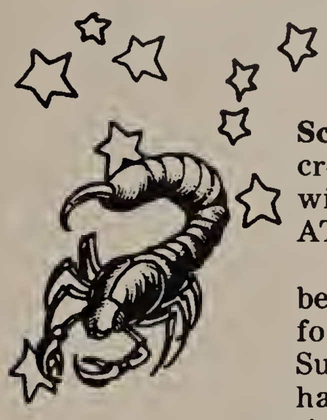
Companies that are in the business of selling long-distance services are popping up — through multilayer marketing. These are the ones that are buying services from a legitimate long-distance company and reselling them to small businesses and individuals.

They offer the customer the privilege of becoming an agent — for a fee. As an agent, the customer recruits others and makes a commission on their sales.

Sound fishy? Horrellscopes has seen a brochure from one of these firms offering an opportunity to "join the billion-dollar telecommunications industry for only $50."

Customers should be warned that nobody makes money except the seller. Users should thoroughly check out providers of long-distance services. Sometimes, pyramids have a curious way of collapsing.

Today, Amway and long-distance; tomorrow, mail-order central offices.



Scorpio: The sign of secrets can surprise users with contracts made with AT&T before divestiture.

A recent ruling might be poison in the purse for former AT&T users. The Superior Court of Georgia has upheld AT&T's position that contracts made before divestiture are valid.

Users who terminated contracts before their expiration dates are in breach, the high court ruled.

For users in Georgia, this means deals made with Bell operating companies, and subsequently transferred to AT&T, are valid.

The ruling also offers a little hint to those users in similar positions throughout the country. What one court in Georgia does, other courts are likely to do.

Horrellscopes is aware of many users who have walked away from their deals with AT&T. Now these users are getting calls from AT&T, which is asking for money and making threatening legal noises.

This puts AT&T in a tough position. The company says it doesn't want to sue anyone, but it wants its money.

Horrell is president of Mitchell & Horrell, Inc. in Memphis, Tenn.

Shooting stars

Watch for some meteoric action within the BOCs from the deregulated subsidiaries.

When it comes to making a purchase decision, the deregulated subsidiaries are no different from any other interconnect companies.

Therefore, users should demand long-term maintenance and the guarantee of spare parts and new distributors if the deal between the BOC and the manufacturer changes.

Here's what will cause all the trouble: The BOCs are demanding things they can't get from the manufacturers. So they'll start going to companies that can provide them with exclusive distribution, quick manufacturing capabilities and cutting-edge features — all this for a low cost, too.

The companies that are willing to do this are all outside the U.S.

The BOCs are restricted from manufacturing equipment; they have to buy their wares from others. But it seems the foreign invaders are the only ones prepared to grant the BOCs the kind of action they want.

So watch for new products from the BOCs. But don't look for an American flag on the box.

Compliments of a friend.

We've received the kind of compliments that should mean a lot to you as a user of private line phone service.

It seems the nation's largest customer of private lines asked *another* giant telecommunications company to rate the quality of half a dozen carriers it uses.

Guess who has the best average during the past six months? Us, obviously.

Using their own test criteria, this other telecommunications giant found that ITT's private line service was the best in the two ways that matter the most:

Circuit noise. And tone level.

Our compliments in return to the people who made the test.

And to our customer who ordered it.

If you're looking for this kind of private line service, we'd be proud to share the test results with you. Write to ITT, 100 Plaza Drive, Secaucus, NJ 07096 or call 800-526-7270 operator 142.

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